The Continental Shelf Beyond 200 Nautical Miles in the Arctic Basin*

*Jianjun Gao***

Résumé

Cet article traite de la difficile détermination des droits des États côtiers de l'océan Arctique au-delà des 200 miles nautiques de leur littoral. L'auteur examine d'abord les prétentions de la Russie et de la Norvège à ce sujet. Il traite ensuite de la propriété des hauts-fonds marins, l'une des principales revendications des États côtiers.

Abstract

This article deals with the difficulties to settle the rights of coastal states in the Arctic Ocean beyond the 200 nautical miles of their coast. In the first part, the author looks at the submissions of Russia and Norway on that issue. In the second part, the author discusses the property rights over the seafloor highs, which constitutes one of the most important claims of coastal states.

* Prepared for the workshop between the International Law Faculty of China University of Political Science and Law and the Faculty of Law of the Université de Montréal.

** Professor of International Law at the China University of Political Science and Law. E-mail: gaojianjun@yahoo.com.

Table of contents

The Arctic Ocean is a semi-enclosed sea bordered by five states: Canada, Denmark (Greenland), Norway, the Russian Federation and the US. The Arctic Basin refers to the central basin of the Arctic Ocean and occupies most part of the seabed and subsoil of the Arctic Ocean that are beyond 200 nautical miles from the coasts of the littoral states. The Arctic Basin is divided into five sub-basins by three through-going ridges of the Arctic Ocean. The Lomonosov Ridge[1], which traverses the Arctic from the New Siberian Islands off the Russian Federation to an area off Greenland (Denmark) and Ellesmere Island of Canada, divides the Arctic Basin into the Amerasia Basin and the Eurasia Basin: the Eurasia Basin consists of the Nansen Basin and the Amundsen Basin which are separated by the Gakkel Ridge, an extension of the Mid-Atlantic spreading ridge; while the Amerasia Basin consists of the Podvodnikov and Makarov Basins and the Canada Basin which are separated by the Alpha-Mendeleev Ridge complex, which is the most extensive ridge system in the Arctic Basin, spanning the basin from the area off Canada and Greenland to Russia[2].

According to article 76 of the *United Nations Convention on the Law of the Sea* (hereinafter "LOS Convention")[3], where the continental margin of the coastal state extends beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured, the state is entitled to the continental shelf beyond 200 nautical miles[4]. On the other hand, such a coastal state shall submit particulars of its proposed outer limits of the continental shelf beyond 200 nautical miles to the Commission on the Limits of the Continental Shelf (hereinafter "CLCS") set up under Annex II of the LOS Convention, along with supporting scientific

1 The Lomonosov Ridge is more than 1500 km long, and the superjacent water depth ranges from more than 4200 m to less than 700 m. Mel Weber, "Defining the Outer Limits of the Continental Shelf across the Arctic Basin: the Russian Submission, States' Rights, Boundary Delimitation and Arctic Regional Cooperation", (2009) *The International Journal of Marine and Coastal Law* 24, 661.

2 *Id.*, 658 and 659.

3 Opened for signature on December 10, 1982 and entered into force on 16 November 1994 (www.UN.org/depts/los). By June 2011, the LOS Convention had 162 State Parties. Information available online at: <www.un.org/Depts/los/reference_files/chronological_lists_of_ratifications.htm#The%20United%20Nations%20Convention%20on%20the%20Law%20of%20the%20Sea>.

4 LOS Convention, art. 76(1). Sometimes the continental shelf beyond 200 nautical miles is referred to as "extended continental shelf" by scholars.

and technical data for the examination by the latter[5]. Until now, all of the five Arctic states have advanced claims to the continental shelf beyond 200 nautical miles in the Arctic Basin by various ways: Russia and Norway have submitted their outer limits of the continental shelf beyond 200 nautical miles in the Arctic to the CLCS in 2001 and 2006 respectively; Denmark intends to make separate submissions for "the maritime areas north, north-east, and south of Greenland"[6]; Canada plans to make its submission in 2013[7]; and the US is making preparation too[8]. It is said that it may be possible for the Arctic coastal states to acquire most seabed of the Arctic Basin[9]. However, the examination by the CLCS of the Russian and Norwegian submissions shows that it would not be an easy task for the Arctic states to succeed in establishing their claims to the seabed and subsoil beyond 200 nautical miles in the Artic Basin, by the application of article 76 of the LOS Convention.

Of the five states bordering the Arctic Basin, four are parties to the LOS Convention[10], with the only exception of the US. It should be noted that some provisions of the LOS Convention reflected the existing customary international law at the time of its adoption, and some others have acquired such a status later. These provisions will be applicable even in cases involving non-state parties to the LOS Convention. As far as article 76 is concerned, however, it "can hardly be viewed as a reflection of

5 *Id*., art. 76(8) and art. 4 of Annex II.

6 *Receipt of the submission made by the Kingdom of Denmark to the Commission on the Limits of the Continental Shelf*, 6 December 2010, CLCS.54.2010.LOS, available online at: <www.un.org/Depts/los/clcs_new/submissions_files/dnk54_10/clcs54e.pdf>.

7 *Issues Related to the Workload of the Commission on the Limits of the Continental Shelf – Tentative Dates of Submissions*, 16 January 2008, SPLOS/INF/20, available online at: <http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/209/61/PDF/N0820961.pdf?OpenElement>.

8 For example, when publishing its limits of the exclusive economic zone, the US declared that these limits "are without prejudice to the outer limit of the continental shelf of the United States where that shelf extends beyond 200 nautical miles from the baseline in accordance with international law". *Public Notice 2237: Exclusive Economic Zone and Maritime Boundaries; Notice of Limits*, 23 August 1995, available at: <www.un.org/Depts/los/LEGISLATIONANDTREATIES/PDFFILES/USA_1995_eez_public_notice.pdf>.

9 Tavis Potts & Clive Schofield, "The Arctic", (2008) 23 *The International Journal of Marine and Coastal Law* 163.

10 Norway ratified the LOS Convention on June 24, 1996, the Russian Federation ratified the LOS Convention on March 13, 1997, while Canada and Denmark ratified the LOS Convention on November 7, 2003 and November 16, 2004, respectively.

customary international law"[11]. Besides, although the US has declared that it accepted and would act in accordance with the LOS Convention's provisions "relating to traditional uses of the oceans"[12], whether article 76 is related to the traditional uses of the oceans is not certain[13]. Therefore, unless the US accedes to the LOS Convention, strictly speaking, the provisions of article 76 will not be definitely applicable between the US and the other Arctic Ocean littoral states[14]. On the other hand, in the Ilulissat Declaration adopted by the five Arctic states in 2008, these states "recall that an extensive international legal framework applies to the Arctic Ocean […]. Notably, the law of the sea provides for important rights and obligations concerning the delineation of the outer limits of the continental shelf, […] and other uses of the sea. We remain committed to this legal framework and to the orderly settlement of any possible overlapping claims"[15]. Today, it is well recognized that "the delineation of the outer limits of the continental shelf" should be achieved in accordance with article 76 of the LOS Convention. Furthermore, the US has already attempted to take part into the work of the CLCS by sending notes to comment the submissions made by other states in accordance with article 76[16]. So it seems reasonable to discuss the present issue within the framework of article 76, though the US has not joined the LOS Convention.

11 Vladimir Golitsyn, "Continental Shelf Claims in the Arctic Ocean: A Commentary", (2009) 24 *International Journal of Marine and Coastal Law* 405.

12 *Statement by the President dated 10 March 1983*, available online at: <www.un.org/Depts/los/LEGISLATIONANDTREATIES/PDFFILES/USA_1983_Statement.pdf>.

13 See, for example, V. Golitsyn, *supra*, note 11, 404.

14 For opposite view, see Oran R. Young, who states that the Arctic Ocean is fully covered by the LOS Convention, and the US has accepted most of the Convention's provisions as a matter of practice: Oran R. Young, "The Arctic in Play: Governance in a Time of Rapid Change", (2008) 23 *The International Journal of Marine and Coastal Law*, 435.

15 *The Ilulissat Declaration, Arctic Ocean Conference*, 29 May 2008, available online at: <www.ambottawa.um.dk/en/servicemenu/News/THEILULISSATDECLARATIONARCTICOCEANCONFERENCE.htm>.

16 For example, see *Notification from the US regarding the submission made by the Russian Federation to the CLCS*, 28 February 2002, available online at: <www.un.org/Depts/los/clcs_new/submissions_files/rus01/CLCS_01_2001_LOS_USAtext.pdf> (hereinafter "Notification from the US"). See also the two letters dated 25 August 2004 and 25 October 2004 that the US sent in relation to the submission of Brazil, available online at: <www.un.org/Depts/los/clcs_new/submissions_files/bra04/clcs_02_2004_los_usatext.pdf>; and <www.un.org/Depts/los/clcs_new/submissions_files/bra04/clcs_2004_los_usatext_2.pdf>.

The purpose of the paper is to discuss some difficulties that the Arctic states might be faced with in making their submissions concerning the Arctic Basin, especially the treatment of seafloor highs in the area. First, the paper will examine the two submissions that have been made by the Arctic states until now and the recommendations of the CLCS made thereupon. In such a small area as the Arctic Basin, the content of one costal state's submission and the issues that it raises with the CLCS could have implications for the whole situation of the continental shelf beyond 200 nautical miles in the area[17]. Second, the paper will discuss the seafloor highs issue in the Arctic area, for it have been acknowledged that this issue is one of the most important aspects of delimiting continental shelf limits for Arctic states[18].

I. The Submissions of Russia and Norway

A. The Russian Submission of 2001

On 20 December 2001, the Russian Federation made its submission to the CLCS according to paragraph 8, article 76 of the LOS Convention. The Russian submission consists of four maritime areas, including the Arctic Basin, which is called "the Arctic Ocean" in the submission[19]. The outer limits of the continental shelf proposed by Russia in this area consist of 27 fixed points: 3 points – points 7, 27, 29 – are defined by the 60 nautical miles from the foot of the continental slope (FOS) formula[20], 17 points are defined by the thickness of sedimentary rocks formula[21], 3 points (points 11, 14, 15) are located on the 200 nautical miles limit from Russia, and 3 points (points 6, 30-32) are on the boundary to be agreed upon with neighboring states (Norway and the US, respectively)[22]. The proposed

17 Ron Macnab, "The Outer Limit of the Continental Shelf in the Arctic Ocean", in M.H. Nordquist, J. Norton Moore and T.H. Heidar (eds), *Legal and Scientific Aspects of Continental Shelf Limits*, Leiden, Martinus Nijhoff Publishers, 2004, p. 308.

18 M. Weber, supra, note 1, 669.

19 See *Executive Summary of the Russian Submission*, available online at: <www.un.org/Depts/los/clcs_new/submissions_files/submission_rus.htm>.

20 LOS Convention, art. 76 (4)(a)(ii).

21 *Id.*, art. 76 (4)(a)(i).

22 See *Executive Summary of the Russian Submission*, supra, note 19, p. 2, Table 1 "Geographic coordinates of the points that define lines of the outer limit of the continental shelf of the Russian Federation in the Arctic Ocean".

outer limits in the Arctic Basin starts point 6, and proceeds eastward by large until point 16. During the course, two sections of the outer limits follow the 200 nautical miles limit of Russia. Then the outer limits turn northward until the North Pole (point 31). After that, the outer limits extend south along the 168.9971 W meridian until point 32, a point inside but very close to the 200 nautical miles limit of Russia[23]. The final section of the limits seems to be the continuation of the maritime boundary between Russian and the US determined in 1990[24]. Consequently, the continental shelf beyond 200 nautical miles claimed by Russia in the Arctic Basin consists of three areas: two small areas are located within the Nansen Basin, while the largest third one is located within the Amerasia Basin and the Amundsen Basin. The claims of Russia in the third part mainly depend on the Lomonosov Ridge and the Alpha-Mendeleev complex. In the view of Russia, these ridges are submerged prolongation of the Russian landmass: "[T]he results of the interpretation of comprehensive geological and geophysical data support the categorization of the Amerasian basin geostructures (Lomonosov ridge and Mendeleev and Alpha rises) as components of the continental margin"[25]. Furthermore, 6 points (points 26-31) involve the use of 2,500 metre isobath, though the 2,500 metre isobath plus 100 nautical mile constraint line is not applied[26], it seems that these ridges have been treated by Russia as submarine eleva-

[23] See *Executive Summary of the Russian Submission*, *supra*, note 19, Map 2 "Area of the continental shelf of the Russian Federation in the Arctic Ocean beyond 200-nautical-mile zone".

[24] Agreement between the United States of America and the Union of Soviet Socialist Republics on the Maritime Boundary, signed on 1 June 1990 and has not become effective. Article 2(1) of the Agreement provides that "From the initial point, 65° 30' N., 168° 58' 37" W., the maritime boundary extends north along the 168° 58' 37" W. meridian through the Bering Strait and Chukchi Sea into the Arctic Ocean as far as permitted under international law." For the Agreement, see: Jonathan I. Charney & Lewis M. Alexander (eds.), *International Maritime Boundaries*, Vol. I, Leiden, Martinus Nijhoff Publishers, 1993, p. 447-461.

[25] *Statement Made by the Deputy Minister for Natural Resources of the Russian Federation during Presentation of the Submission Made by the Russian Federation to the Commission on 28 March 2002*, 5 April 2002, Doc. CLCS/31, p. 5.

[26] LOS Convention, art. 76 (5). However, the distance between fixed point 28 and the 2,500 metre isobath is 102.55 nautical miles, thus exceeding the 100 nautical miles constraint. See *Executive Summary of the Russian Submission*, supra, note 19, p. 2, Table 1.

tions in the sense of paragraph 6, article 76[27]. The continental shelf beyond 200 nautical miles that Russia claimed in the Arctic Ocean amounts to 1,191,000 km^2 [28], maybe the largest Arctic claim[29]. The other Arctic coastal states gave adverse comment on the Russian submission[30]. On the basis of the subcommission' consideration, the CLCS adopted its recommendations about half a year later by consensus. For the Arctic Basin, which is called "the Central Arctic Ocean" in the recommendations, the CLCS expressed reservations concerning the information presented by Russia to substantiate the linkage between the above mentioned ridges and the landmass of Russia, and therefore opted not to proceed with an assessment of the proposed outer limits in the area[31]. Accordingly, the CLCS recommended that Russia "make a revised submission in respect of its extended continental shelf in that area based on the findings contained in the recommendations"[32]. Now Russia is preparing for its revised submission.

B. The Norwegian Submission of 2006

On 27 November 2006, Norway made a submission to the CLCS, which consists of three separate maritime areas in the North East Atlantic

27 Article 76 (6) of the LOS Convention provides: "Notwithstanding the provisions of paragraph 5, on submarine ridges, the outer limit of the continental shelf shall not exceed 350 nautical miles from the baselines from which the breadth of the territorial sea is measured. This paragraph does not apply to submarine elevations that are natural components of the continental margin, such as its plateaux, rises, caps, banks and spurs."

28 See Tomasz Górski, "A Note on Submarine Ridges and Elevations with Special Reference to the Russian Federation and the Arctic Ridges", (2009) 40 *Ocean Development & International Law* 51.

29 M. Weber, supra, note 1, 660.

30 Notification from Canada, 26 February 2002; Notification from Denmark, 26 February 2002; Notification from Norway, 2 April 2002; Notification from the US, 28 February 2002, *Executive Summary of the Russian Submission*, supra, note 19.

31 See Ron Macnab, *Russia's Submission for Continental Shelf Extensions: The First Test of UNCLOS*, Article 76, July 2003, p. 64.

32 See *Report of the Secretary-General of the United Nations to the Fifty-seventh Session of the United Nations General Assembly under the agenda item Oceans and the Law of the Sea*, 8 October 2001, A/57/57/Add.1, para. 41, available at: <http://daccessdds.un.org/doc/UNDOC/GEN/N02/629/28/PDF/N0262928.pdf? OpenElement>. Article 8 of Annex II to the LOS Convention provides that "[i]n the case of disagreement by the coastal State with the recommendations of the Commission, the coastal State shall, within a reasonable time, make a revised or new submission to the Commission".

and the Arctic: the Banana Hole in the Norwegian Sea, the Loop Hole in the Barents Sea, and the Western Nansen Basin in the Arctic Ocean[33]. The Nansen Basin is bounded to the north by the Gakkel Ridge, and the southern flank of the basin consists of parts of the continental slope of Norway (including Svalbard) and of the Russian Federation (including Franz Josef Land)[34]. The proposed outer limits of the continental shelf beyond 200 nautical miles in this area consist of 94 fixed points: 2 points are defined by the sediment thickness formula and 92 points are defined by the 60 nautical miles from the FOS formula[35]. These formula points are generated from two critical FOS points, which are located on the part of the continental margin associated with the Franz-Victoria Fan adjacent to the Barents Sea shelf and at the northern tip of the Yermak Plateau[36]. The Franz-Victoria Fan is one of the major glacio-marine fans in the region, and dominates the continental margin adjacent to the Nansen Basin between Svalbard and Franz Josef Land[37]. The Yermak Plateau is a continental margin feature that formed during the episode of rifting and breakup that accompanied the south-westward propagation of the Gakkel Ridge seafloor spreading system, and the north-western and northern margins of the Yermak Plateau may be readily delineated by the FOS envelope[38]. The outer limits proposed by Norway do not exceed the 350 nautical miles constraint, but in some parts exceed the 2,500 metre isobath plus 100 nautical mile constraint[39]. After examination, the CLCS adopted its recommendations on 27 March 2009. The CLCS agrees with the location of the FOS points submitted by Norway[40], the determination of the fixed points

33 *Executive Summary of the Norwegian Submission*, part 2, available online at: <www.un.org/Depts/los/clcs_new/submissions_files/submission_nor.htm>.

34 *Id.*, part 7.2.

35 *Executive Summary of the Norwegian Submission*, supra, note 33, part 7.2.

36 *Summary of the Recommendations of the Commission on the Limits of the Continental Shelf in regard to the Submission made by Norway in respect of Areas in the Arctic Ocean, the Barents Sea and the Norwegian Sea on 27 November 2006*, CLCS, 27 March 2009, para. 27, available at: <www.un.org/Depts/los/clcs_new/submissions_files/nor06/nor_rec_summ.pdf> (hereinafter "*Recommendations of the CLCS for Norway*").

37 *Id.*, para. 28.

38 *Id.*, para. 30.

39 *Id.*, Figure 6 "Map of the Western Nansen Basin area of the Arctic Ocean indicating the extent of the submerged prolongation of Norway from the landmass of Svalbard".

40 *Id.*, paras 29 and 30. During the examination of the Sub-Commission, Norway relocated the FOS point at the Franz-Victoria Fan to a new more seaward position, with the support of a new high-resolution sub-bottom profiler data. The Sub-Commission agreed with the location of the revised FOS point.

which have been adjusted a little under the examination, the principles applied in delineating the outer limits, and recommends that Norway proceeds to establish the outer limits of the continental shelf in the Western Nansen Basin area on the basis of the recommendations[41]. It is worth noting that the final section of the outer limits of Norway (the section east of AO1) has not been delineated[42], because Norway and Russia may need to delimit their continental shelf beyond 200 nautical miles where the submission of Russia for the area is approved by the CLCS.

Thus until now, the Western Nansen Basin is the only area in the Arctic Basin that the littoral states have established their entitlements to the continental shelf beyond 200 nautical miles successfully. However, the recommendations of the CLCS, particularly its positions on seafloor highs in the Arctic Ocean, have much implication for the potential submissions in the other parts of the area.

II. The Seafloor Highs Issue in the Arctic Ocean

The Arctic Ocean is richly endowed with seafloor highs, which are located adjacent to the continental margins of all Arctic states[43]. The seafloor highs in the area consist of two kinds: continental borderlands and through-going ridges. The borderlands include the Yermak Plateau north of Svalbard, the Morris Jessup Plateau north of Greenland, and the Chukchi Plateau north of Alaska. These submerged features extend into the deep Arctic Basin from the surrounding continental margins: the Yermak Plateau projects into the Nansen Basin, the Morris Jessup Plateau projects into the Amundsen Basin, and the Chukchi Plateau projects into the Canada Basin[44]. As mentioned above, there are three through-going ridges in the Arctic Basin: the Gakkel Ridge, the Lomonosov Ridge and the Alpha-Mendeleev Ridge complex, from west to east. Article 76 of the LOS Convention mentions three kinds of seafloor highs: oceanic ridges of the deep

41 *Id.*, para. 40.

42 *Id.*

43 R. Macnab, *supra*, note 17, p. 301.

44 See Arthur Grantz, "Treatment of Ridges and Borderlands Under Article 76 of the UN Convention on the Law of the Sea (UNCLOS): the Example of the Arctic Ocean", in M.H. Nordquist, J. Norton Moore and T.H. Heidar (eds*), Legal and Scientific Aspects of Continental Shelf Limits*, Leiden, Martinus Nijhoff Publishers, 2004, p. 203 and 204.

ocean floor (paragraph 3), submarine ridges (paragraph 6) and submarine elevations that are natural components of the continental margin (paragraph 6), and assigns each of them different legal status as regards the entitlement to an continental shelf beyond 200 nautical miles and the delineation of its outer limits[45]. However, application of article 76 to the Arctic Ocean is challenging because the geomorphic and geological character of its seafloor, especially in the Arctic Basin, is as yet imperfectly understood[46].

As far as the three borderlands are concerned, the legal status of Yermak Plateau has been determined generally. In its recommendations to Norway, the CLCS recognizes that the margin of Norway includes the Yermak Plateau[47]. Because in the Western Nansen Basin area Norway invoked the distance constraint only[48], which lies much further than the 2,500 metre isobath plus 100 nautical mile constraint line in the region, the CLCS did not discuss whether the Yermak Plateau is a submarine elevation that is a natural component of the continental margin in the sense of paragraph 6, article 76. Besides, the CLCS mentions the Morris Jessup Plateau side by side with the Yermak Plateau, observing that "[t]he Yermak Plateau, and its conjugate feature the Morris Jessup Rise […] are continental margin features" sharing the same origin[49]. Thus, the CLCS seems to recognize that the Morris Jessup Rise could be included in the margin of Greenland. For the Chukchi Plateau, the representative of the US delegation emphasized on the Third Conference on the Law of the Sea that "features such as the Chukchi Plateau situated to the north of Alaska and its component elevations could not be considered a ridge and were covered by the last sentence of the proposed paragraph [6] of article 76"[50]. Thus the US treats the Chukchi Plateau as a natural component of the Alaskan continental margin which should not be subject to the 350 nautical miles constraint. According to the US representative, "to the best of his knowledge, there was no contrary interpretation"[51]. In a word, the three border-

45 *Scientific and Technical Guidelines of the Commission on the Limits of the Continental Shelf*, 13 May 1999, para. 7.1.1, available at <www.un.org/Depts/los/clcs_new/commission_documents.htm#Guidelines> [hereinafter "*Guidelines*"].

46 A. Grantz, *supra*, note 44, p. 202.

47 *Recommendations of the CLCS for Norway*, supra, note 36, para. 25.

48 *Id.*, para. 35.

49 *Id.*, para. 30.

50 The 128th Plenary Meeting (1980), p. 43, para. 156.

51 *Id.*

lands could be taken as submarine ridge or submarine elevation in the sense of paragraph 6, article 76.

Besides the borderlands, consensus has also been reached over the legal status of the Gakkel Ridge. The ridge, also know as the Arctic Mid-Ocean Ridge, is a currently active seafloor spreading system[52]. According to paragraph 3 of article 76, the continental margin "does not include the deep ocean floor with its oceanic ridges or the subsoil thereof". Mid-ocean ridge is the best example of the oceanic ridges. The CLCS has observed: "It is generally recognised that the true oceanic features of the seafloor […] include both the ocean basin floor and MOR zones. This categorisation is reflected in article 76, paragraph 3, of the Convention"[53]. It should be noted that the outer limits of Norway in the Nansen Basin follow the southern flank of the Gakkel Ridge.

The legal status of the Lomonosov Ridge and the Alpha-Mendeleev Ridge system are more complicated and many different views exist. In its submission, Russia asserted that the Lomonosov Ridge and the Alpha-Mendeleev Ridge complex were the submerged prolongation of its land-mass. However, the US challenged these claims of Russia in its notification to the Under-Secretary-General of the UN:

> "Mounting geologic and geophysical evidence indicates that the Alpha-Mendeleev Ridge System is the surface expression of a single continuous geologic feature that formed on oceanic crust of the Arctic Ocean basin by volcanism over a 'hot spot'. […] the Alpha-Mendeleev Ridge is identical in origin to the Iceland-Faroe Ridge, an oceanic ridge of volcanic origin of similar thickness and morphology. […] The Alpha-Mendeleev Ridge is therefore a volcanic feature of oceanic origin that was formed on […] the oceanic crust that underlies the Amerasia Subbasin of the deep Arctic Ocean Basin. It is not part of any State's continental shelf"[54].

---

52 *Recommendations of the CLCS for Norway*, *supra*, note 36, para. 25.

53 *Summary of Recommendations of the Commission on the Limits of the Continental Shelf in regard to the Submission Made by the United Kingdom of Great Britain and Northern Ireland in respect of Ascension Island on 9 May 2008*, 15 April 2010, para. 27, available online at: <www.un.org/Depts/los/clcs_new/submissions_files/gbr08/gbr_asc_isl_rec_summ.pdf. But according to the CLCS, where islands surmount the active spreading ridges, "it would be difficult to consider that those parts of the ridge belong to the deep ocean floor". *Guidelines*, *supra*, note 45, para. 7.2.8.

54 *Notification from the US*, *supra*, note 16, p. 2.

Regarding the Lomonosov Ridge, which is understood to be a continental sliver that separated from the continental margin of Scandinavia and northwestern Russia by the sea floor spreading[55], the US stated: "The ridge is a freestanding feature in the deep, oceanic part of the Arctic Ocean Basin, and not a natural component of the continental margins of either Russia or any other State."[56] The CLCS did not accept the arguments of Russia in its recommendations.

The controversy over the legal status of these ridges derives, first of all, from the lack of consensus over the geological history and structure of these physiographic features[57]. It has been reported that when it questioned the categorization of the Lomonosov Ridge and the Alpha-Mendeleev Complex as submerged prolongation of the Russian landmass, the CLCS cited "alternative hypotheses for the nature and structure" of these features[58]. In order to make a revised submission, Russia has launched several scientific expeditions and one of the objectives of these expeditions is to gather information to confirm the existence of a linkage between the Mendeleev and Lomonosov Ridges and the Siberian margin[59]. Besides, Canada and Denmark also began appurtenance testing of the Lomonosov Ridge through both independent and joint projects[60].

But the scientific uncertainty is not the sole cause behind the controversy. The relevant provisions of the LOS Convention do not define the three kinds of seafloor highs precisely and therefore are subject to diverse interpretation. So even consensus has been reached among scientists over the scientific characters of these ridges, international lawyers may still continue to argue over their exact legal categorizations under article 76. According to article 76, oceanic ridges are not natural prolongation of the coastal states, while submarine ridges and submarine elevations are. So it is critical to determine the meaning of the term natural prolongation in the LOS Convention. Though different arguments have been put forward in this respect, the LOS Convention appears to define the term from the perspective of geomorphology. The concept of natural prolongation in

55 M. Weber, *supra*, note 1, 661. See also A. Grantz, *supra*, note 44, p. 207.
56 *Notification from the US*, *supra*, note 16, p. 3.
57 M. Weber, *supra*, note 1, 669.
58 R. Macnab, *supra*, note 17, p. 303.
59 M. Weber, *supra*, note 1, 678.
60 *Id.*, 677 and 678.

paragraph 1 of article 76 is defined by the concept of continental margin, for the extent of natural prolongation is the "the outer edge of the continental margin". According to paragraph 4, for the purposes of the LOS Convention, the outer edge of the continental margin shall be established by application of the two formulae provided for in the paragraph on the basis of the FOS, which is defined as, "in the absence of evidence to the contrary, the point of maximum change in the gradient at its base"[61]. Such expression shows that the determination of the FOS by means of geomorphological evidence is "a general rule" and resorting to the evidence to the contrary is "an exception to the rule"[62]. Thus, for a submarine feature to be taken as submerged prolongation of the adjacent margin, the existence of geomorphological continuity between the feature and the continental margin has to be proved, in the sense that the FOS line around the ridge is linked to the FOS line around the continental margin[63]. Furthermore, paragraph 3 of article 76 provides that the continental margin does not include the deep ocean floor with its oceanic ridges or the subsoil thereof. This provision lays down the second and higher requirement that any seafloor high has to satisfy before it can be categorized as the component of the adjacent continental margin, that is, it does not belong to the oceanic ridge of the deep ocean floor.

According to Grantz, the recorded water depths in the Arctic Basin range more than 4000 m and are comparable to those of the major ocean basins today (4000 m to 6000 m), which indicates that the crust which underlies the Basin is similar to that which underlies the major ocean basins, and likewise consists of oceanic crust[64]. The fact that the Arctic Basin is underlain by oceanic crust means that the Lomonosov Ridge and the Alpha-Mendeleev Complex lie within the deep ocean floor. Furthermore, these through-going ridges are separated from the adjacent continental shelves by well-developed continental slopes, and bathymetric lows lie between both ends of these ridges and the adjacent continental

61 LOS Convention, art. 76 (4)(b).

62 *Guidelines*, *supra*, note 45, para. 5.1.3 and 6.1.2.

63 Steinar Thor Gudlaugsson, "Natural Prolongation and the Concept of the Continental Margin for the Purposes of Article 76", in Myron H. Nordquist, John Norton Moore & Tomas H. Heidar (eds), *Legal and Scientific Aspects of Continental Shelf Limits*, Leiden, Martinus Nijhoff Publishers, 2004, p. 89.

64 A. Grantz, *supra*, note 44, p. 204 and 205.

shelves[65]. So it is doubtful whether geo-morphological continuity between these ridges and the adjacent margin exists. Although subject to some disagreement[66], according to Grantz, "the through-going ridges of the oceanic central Arctic Ocean Basin lie wholly within the confines of the central basin and are therefore part of the deep ocean floor. They are not natural prolongations of the land territories of the adjacent costal states and do not provide a basis for projecting the juridical continental margins across adjacent areas of the central Arctic Ocean Basin"[67].

In light of the analysis above, that is, the three borderlands are submerged prolongation of the adjacent landmass, while the three through-going ridges are not, some "donut holes" beyond the jurisdiction of the littoral states will exist in the Arctic Basin. According to Ron Macnab, there are four potential such "donut holes" (Figure 1): the first is an elongated region that encompasses the Gakkel Ridge, the second one is over the central segment of the Lomonosov Ridge, the third is over the western segment of the Alpha Ridge, and the fourth is a small trapezoidal area in the Canada Basin between the Chukchi Cap and the Alpha Ridge, because the sediment thickness formula cannot be realized in the Canada Basin[68]. In addition, there would be another "donut hole" over the Mendeleev Ridge (E3), for it should not be classified as submerged prolongations of the land masses of adjacent coastal states. According to the LOS Convention, these "donut holes" belong to the "Area", which and whose resources are "the common heritage of mankind"[69].

65 *Id.*, p. 207.

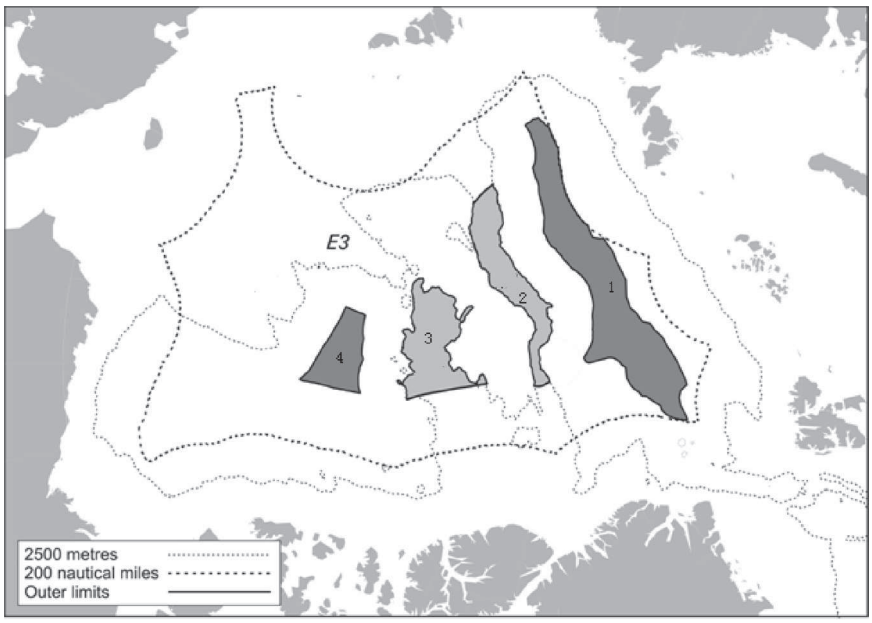
66 For example, according to Górski, the Lomonosov and Mendeleev Ridges may be submarine elevations. T. Górski, *supra*, note 28, 57.

67 A. Grantz, *supra*, note 44, p. 201. See also M. Weber, supra, note 1, 661.

68 R. Macnab, *supra*, note 17, p. 302, 305 and 309.

69 LOS Convention, art. 1(1)(1) and 136.

Figure 1 – Potential "donut holes" in the Arctic Basin



Source: Figure modified from Ron Macnab, "The Outer Limit of the Continental Shelf in the Arctic Ocean", in M.H. Nordquist, J. Norton Moore and T.H. Heidar (eds), *Legal and Scientific Aspects of Continental Shelf Limits*, Leiden: Martinus Nijhoff Publishers, 2004, Figure 5).

*
* *

"The Arctic Ocean stands at the threshold of significant changes" because of the global warming and the development in the political and legal arena. Compared with the Antarctica, there has not been a specific comprehensive treaty regime for the Arctic area. But the absence of such a treaty system does not follow that there is no legal framework for the Arctic currently. By contrast, the law of the sea, especially the LOS Convention, plays an important role in this regard[70], for the Arctic Ocean is not fundamentally different from the other oceans of the world. As far as the continental shelf beyond 200 nautical miles in the Arctic Basin is concerned, this matter involves the interpretation and application of the LOS Convention, particularly article 76. The recommendations of the CLCS made to submissions of Russia and Norway confirm that the claims of the

[70] *The Ilulissat Declaration*, 28 May 2008.

Arctic Ocean littoral states to the continental shelf beyond 200 nautical miles in the Arctic Basin should be examined in accordance with the scientific and legal standards. However, due to the unique circumstances in the area, "[a] broad scientific consensus of the relevant experts"[71] has not been reached over many geophysical aspects of the Arctic Basin. Furthermore, the legal character of some important seafloor highs in the area is subject to serious controversy too. In light of these uncertainties, the CLCS should take a cautious approach. As the US suggested in relation to the Russian submission, "[i]f the Commission is unsure, it should not make a recommendation but should announce that it needs further data, analysis and debate"[72]. A suggestion followed by the CLCS.

[71] *Id*.

[72] *Notification from the US*, *supra*, note 16, p. 3.