

Briefing notes for IBRU Arctic map series

All measures in these briefing notes are in nautical miles (M). 1 nautical mile = 1.852 kilometre. 1 square nautical mile = 3.434 square kilometre. All figures are rounded to the nearest 100 square nautical miles.

Note 1. This map illustrates Arctic Ocean continental shelf areas, as well as exclusive economic zones (EEZs) and miscellaneous special management areas and unresolved and agreed boundary lines and limits in waters north of 66°33'N). Continental shelf submissions are made to the Commission on the Limits of the Continental Shelf (CLCS) using criteria established in Article 76 of the United Nations Convention on the Law of the Sea (UNCLOS) (see https://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf). Where the continental margin of a coastal state extends beyond 200 nautical miles (M) from the state's territorial sea baseline, the outer limit of the continental shelf is defined with reference to two sets of points: (i) points 60 M from the foot of the continental slope; (ii) points at which the thickness of sediment is at least 1% of the shortest distance from the points in question to the foot of the continental slope. The outer limit of the continental shelf is defined by a series of straight lines (not exceeding 60 M in length) connecting the seawardmost of the points in the two sets described above. Each coastal state's outer limit is constrained by one of two 'cutoff' criteria that apply regardless of the location of the foot of the continental slope and the thickness of sediment seaward of that point. The 'cutoff' limit is the seawardmost combination of two lines: (i) a line 350 M from the state's territorial sea baseline; (ii) a line 100 M seaward of the 2,500 metre isobath.

Because the Central Arctic Ocean seabed contains a number of ridges where ocean depth falls short of 2,500 metres, there are significant areas of continental shelf overlap, including a 214,800 square nautical mile area around the North Pole that is included in the Canadian, Danish, and Russian submissions. UNCLOS envisions that there will be many areas in the world where states' continental shelves legitimately overlap. It therefore calls for one state's submission to be assessed without prejudice to the submission of another state, and for the peaceful and lawful settlement of overlaps in order to achieve an equitable solution. Because arbitration panels, courts, and tribunals have often turned to median lines as the foundation for achieving equitable maritime delimitations, they are depicted on this map as a reference point for potential continental shelf delimitation.

Conversely, the topography of the Arctic Ocean seabed means that some areas are beyond any state's claim and instead become part of The Area, the portion of the seabed beyond 200M from baselines that is administered by the International Seabed Authority. In the Arctic, this includes the 2,500 square nautical mile 'Banana Hole' between Svalbard and Jan Mayen and 4,000 square nautical miles in the Central Arctic Ocean between Franz Josef Land and the North Pole.

Note 2. Canada deposited its partial submission regarding its Arctic Ocean continental shelf with the CLCS on 23 May 2019 (see https://www.un.org/Depts/los/clcs_new/submissions_files/can1_84_2019/CDA_ARC_ES_EN_secured.pdf) and filed an addendum to that submission on 22 December 2022 (see https://www.un.org/depts/los/clcs_new/submissions_files/can1_84_2019/cda1eseng.pdf) that significantly increased the size of its shelf, from approximately 352,200 square nautical miles to 593,100 square nautical miles beyond 200 M from its baselines, reaching at several points to the limits Russia's exclusive economic zone on the opposite side of the Arctic Ocean. A cartographic comparison of the submission before and after the addendum can be found on the IBRU website at <https://www.durham.ac.uk/research/institutes-and-centres/ibru-borders-research/maps-and-publications/maps/arctic-maps-series/>. Noting, in the original submission, that "the continental margin of Canada in the Arctic Ocean is part of a morphologically continuous continental margin that includes a number of extensive seafloor highs" and that "these seafloor highs include the Central Arctic Plateau (Lomonosov Ridge, Alpha Ridge, and Mendeleev Rise) that forms the submerged prolongation of the landmass of Canada," Canada's submission, after the 2022 addendum, included, in addition to overlaps with a potential USA submission, the Canadian submission includes c. 223,100 square nautical miles of overlap with the Kingdom of Denmark's submission and c. 217,200 square nautical miles of overlap with Russia's submission. These figures include a 214,800 square nautical mile area that includes the North Pole that falls within the continental shelf areas of Canada, the Kingdom of Denmark, and Russia. The submission refers to non-objection agreements with all three neighbours that allow for consideration of the

Canadian submission without prejudice to future delimitation negotiations.

Note 3. The Kingdom of Denmark, Iceland and Norway concluded a delimitation of the continental shelf beyond 200 nautical miles in the southern part of the “Banana Hole” in the Northeast Atlantic in September 2006 (see <https://www.regjeringen.no/en/dokumenter/Agreed-Minutes/id446839/>). As the delimitation agreement preceded submissions to the CLCS, the agreement made provision for adjustments to the delimitation if any of the three states was unable to demonstrate entitlement over the full area of continental shelf allocated to it under the agreement. Both Denmark and Norway confirmed entitlement to the whole of the area allocated in the 2006 agreement through submissions to the CLCS (see the summaries of the CLCS recommendations at www.un.org/depts/los/clcs_new/submissions_files/dnk28_09/2014_03_14_SCDNK_REC_COM_20140521.pdf and www.un.org/depts/los/clcs_new/submissions_files/nor06/nor_rec_summ.pdf). However, the continental shelf limit submitted by Iceland for the Ægir Basin fell short of the boundary with Norway established in 2006 (see https://www.un.org/depts/los/clcs_new/submissions_files/isl27_09/2016_03_10_sc_isl.pdf for the summary of the CLCS recommendations concerning the outer limits of Iceland’s continental shelf in the Ægir Basin). Under the terms of the 2006 agreement, the area beyond Iceland’s continental shelf limit - which lies entirely within the continental shelf limits of both Denmark and Norway - will be shared between Denmark (40 per cent) and Norway (60 per cent).

The Kingdom of Denmark made a partial submission to the CLCS concerning the outer limit of the North-Eastern Continental Shelf of Greenland on 26 November 2013 (www.un.org/depts/los/clcs_new/submissions_files/dnk68_13/DNK2013_ES.pdf). The proposed limit creates an overlap with the continental shelf of Norway as recommended by the CLCS (see note 4) of approximately 140 square nautical miles. It also means that 2,500 square nautical miles of seabed between Jan Mayen and Svalbard will form part of The Area (the deep seabed on which no state can claim sovereign rights).

The Kingdom of Denmark made a second partial submission to the CLCS concerning the outer limit of the Northern Continental Shelf of Greenland on 15 December 2014 (www.un.org/depts/los/clcs_new/submissions_files/dnk76_14/dnk2014_es.pdf). The submission argues that the Lomonosov Ridge, which runs across the central Arctic Ocean, is “both morphologically and geologically an integral part of the Northern Continental Margin of Greenland”. On this basis, the Kingdom of Denmark has defined a continental shelf limit straddling the ridge which extends up to the outer limit of the Russian exclusive economic zone, more than a thousand nautical miles from the nearest point on the coastline of Greenland. The area of continental shelf beyond 200 nautical miles from Greenland’s baselines defined in the submission is around 261,000 square nautical miles. The continental shelf defined by the Kingdom of Denmark overlaps with the continental shelf areas beyond 200 nautical miles submitted to the CLCS by Norway (overlap = c.3,000 square nautical miles), Russia (overlap = c.217,200 square nautical miles), and Canada (overlap = c. 223,100 square nautical miles). These figures include a 214,800 square nautical mile area around the North Pole where submissions by Canada, the Kingdom of Denmark, and Russia all overlap. The submission notes that the Greenland shelf is also likely to overlap with a future continental shelf submission by the USA. The executive summary notes that the Kingdom of Denmark has consulted with all of its neighbours regarding its submission, and refers to non-objection agreements with Norway and Russia that allow the CLCS to consider the Danish submission without prejudice to the future delimitation of the areas submitted by the respective parties.

Note 4. A 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 can be found at www.un.org/depts/los/clcs_new/submissions_files/nor06/nor_rec_summ.pdf.

Note 5. Russia made the very first submission to the CLCS on 20 December 2001 (www.un.org/Depts/los/clcs_new/submissions_files/submission_rus.htm), to which the Commission responded with a request for more data. Russia filed a partial revised submission on 3 August 2015 and a subsequent addendum to the revised submission on 31 March 2021 (www.un.org/depts/los/clcs_new/submissions_files/submission_rus_rev1.htm). On 6 February 2023, the CLCS issued a recommendation on Russia’s 2015 revised submission (incorporating the 2021 addendum) which identified an area in the South Amundsen Basin where further data was needed (https://www.un.org/depts/los/clcs_new/submissions_files/rus01_rev15/2023RusRev1RecSum.pdf). Russia

responded eight days later (on 14 February 2023) with a further revised submission providing data for the South Amundsen Basin (https://www.un.org/depts/los/clcs_new/submissions_files/submission_rus_rev2.htm). Then, on 30 October 2023, Russia submitted a third partial revised submission (https://www.un.org/depts/los/clcs_new/submissions_files/submission_rus_rev3.htm). This third revised submission relies on new data to support inclusion of the Gakkel Ridge, a geological formation that had been included in the 2021 addendum to the first revised submission but was then excluded from the CLCS' February 2023 recommendation. For a comparison of area contained in the original 2001 submission, the 2015 first revised submission, the 2021 addendum, and the CLCS' February 2023 recommendation (including Russia's subsequent second revised submission), and the October 2023 third revised submission, see the 'Russia's Evolving Central Arctic Ocean' submission page at <https://www.durham.ac.uk/research/institutes-and-centres/ibru-borders-research/maps-and-publications/maps/arctic-maps-series/>.

With the October 2023 third revised submission, Russia's extended continental shelf is approximately 608,000 square nautical miles in area. This includes areas of overlap with the submissions previously made (but not yet evaluated by the CLCS) by the Kingdom of Denmark (overlap = c. 217,200 square nautical miles) and Canada (overlap = c. 436,500 square nautical miles). These figures include a c. 214,800 square nautical mile area around the North Pole where the submissions of Canada, the Kingdom of Denmark and Russia all overlap. Noting the overlap between the Russian and Danish submissions to the CLCS, and what was then understood as a likely overlap between the Russian submission and a future Canadian submission, the 2015 submission refers to non-objection agreements with its neighbours which allow for consideration of the Russian submission without prejudice to future delimitation negotiations, and CLCS procedures regarding overlapping claims are further referenced in subsequent submissions.

Note 6. Norway and the Soviet Union agreed to a partial maritime boundary in Varangerfjord in 1957 but for many years were unable to agree on the alignment of their maritime boundary in the Barents Sea: Norway claimed the boundary should follow the median line, while Russia sought a 'sector' boundary extending due north (but deviating around the 1920 Svalbard Treaty area). In July 2007 the Varangerfjord boundary was extended through the innermost 73 km of the disputed area, and in September 2010 an agreement was finally signed extending the boundary northwards through the Barents Sea to the outer limit of the two countries' overlapping continental shelf entitlements in the Arctic Ocean. In the area to the east of the boundary which lies within 200 M of the Norwegian mainland but more than 200 M from Russian territory, the agreement grants Russia the EEZ rights that would otherwise fall to Norway (this "Special Area" is similar to those established in the vicinity of the Russia-USA maritime boundary in 1990 – see Note 9). The 2010 agreement renewed fisheries cooperation agreements originally signed in 1975 and 1976 for at least a further fifteen years, but the 'Grey Zone' fishing regime established in 1978 has been terminated. The agreement also includes provisions for cooperative exploitation and management of transboundary hydrocarbon deposits.

Note 7. Although not party to the United Nations Convention on the Law of the Sea (UNCLOS), the USA recognises the Extended Continental Shelf regime detailed in Article 76 of UNCLOS as customary international law. To that end, on 19 December 2023 the USA announced the limits of its continental shelf using the Article 76 criteria (https://www.state.gov/wp-content/uploads/2023/12/ECS_Executive_Summary.pdf), and it announced that it would file these limits with the CLCS upon accession to the Convention and also that "the United States is also open to filing its submission package with the Commission as a non-Party to the Convention." The area identified by the USA as its Arctic Extended Continental Shelf is c. 151,500 square nautical miles, approximately 72,000 square nautical miles of which overlaps with area included in Canada's submission. In addition, a small portion of the overlap between the USA and Canada is also within the area recognised as Russia's continental shelf in the CLCS' February 2023 recommendation on Russia's submission.

Note 8. Canada argues that the maritime boundary in the Beaufort Sea was delimited in the 1825 treaty between Great Britain and Russia defining the boundary between Alaska and the Yukon as following the 141° W meridian "as far as the frozen ocean". The USA argues that no maritime boundary has yet been defined and that the boundary, out to the 200M limit of the EEZ, should follow the median line between the two coastlines. The area of overlap between the two claims is more than 7,000 square nautical miles. Resolution of this boundary could potentially affect the delimitation of continental shelves beyond 200M as well as the delimitation of territorial seas and exclusive economic zones.

Note 9. The Eastern Special Area lies more than 200 M from the baseline of the USA but less than 200 M from the baseline of Russia. Under the June 1990 boundary agreement between the two states, the Soviet Union agreed that the USA should exercise EEZ jurisdiction within this area. A second Eastern Special Area and a Western Special Area (in which the opposite arrangement applies) were established adjacent to the boundary south of 60° north. The agreement has yet to be ratified by the Russian parliament but its provisions have been applied since 1990 through an exchange of diplomatic notes.

Note 10. Under a treaty signed in February 1920, Norway has sovereignty over the Svalbard archipelago and all islands between latitudes 74° and 81° north and longitudes 10° and 35° east. However, citizens and companies from all treaty nations enjoy the same right of access to and residence in Svalbard. Right to fish, hunt or undertake any kind of maritime, industrial, mining or trade activity are granted to them all on equal terms. All activity is subject to legislation adopted by Norwegian authorities, but there may be no preferential treatment on the basis of nationality. Norway is required to protect Svalbard's natural environment and to ensure that no fortresses or naval bases are established. 39 countries are currently registered as parties to the Svalbard treaty.

Note 11. Under the 1981 continental shelf boundary agreement between Iceland and Norway, each country is entitled to a 25% share in petroleum activities on the other's continental shelf within a 45,470 km² area between latitudes 68° N and 70° 35' N and longitudes 6° 30' W and 10° 30' W. The idea of a joint development zone straddling the boundary was proposed by a conciliation commission set up by the two governments when they were unable to reach a negotiated boundary settlement. The continental shelf boundary itself is located 200 M from the coast of Iceland but less than 100 M from Jan Mayen, reflecting the significant disparity in the lengths of the relevant coastal fronts (more than 18:1 in Iceland's favour).

Note 12. Canada claims that the waters of its Arctic archipelago are historic internal waters, and has enclosed them within a system of straight baselines. Accordingly, Canada holds that there is no right of innocent passage through these waters. However, other states (particularly the USA) do not accept Canada's baselines and also argue that the channels in the archipelago which form part of the 'Northwest Passage' through the Arctic qualify as straits used for international navigation under Part III of UNCLOS, and that there is therefore a right of transit passage through the straits for foreign ships and aircraft. Similar issues affect the straits of the 'Northeast Passage' (or 'Northern Sea Route') around Russia's Arctic coastline.

Agreed maritime boundaries

- Canada-Denmark (Greenland): continental shelf boundary agreed 17 December 1973, with further boundary in EEZs and through Hans Island agreed 14 June 2022.
- Denmark (Greenland)-Iceland: continental shelf and fisheries boundary agreed 11 November 1997.
- Denmark (Greenland)-Norway (Jan Mayen): continental shelf and fisheries boundary agreed 18 December 1995 following adjudication by the International Court of Justice.
- Denmark (Greenland)-Iceland-Norway (Jan Mayen) tripoint agreed 11 November 1997.
- Denmark (Greenland)-Norway (Svalbard): continental shelf and fisheries boundary agreed 20 February 2006.
- Iceland-Norway (Jan Mayen): fisheries boundary following the 200 nm limit of Iceland's EEZ agreed 28 May 1980; continental shelf boundary and joint zone agreed 22 October 1981 (see note 11).
- Norway-Russia: maritime boundary in Varangerfjord partially delimited 15 February 1957 and extended 11 July 2007. Agreement on the maritime boundary in the Barents Sea and Arctic Ocean signed on 15 September 2010 and entered into force on 7 July 2011 (see note 6).
- Russia-USA: single maritime boundary agreed 1 June 1990 (see note 9).