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Preliminary study illustrating various formulae for the definition of the continental shelf

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DOCUMENTS OF THE SECOND COMMITTEE

DOCUMENT A/CONF.62/C.2/L.98 AND ADD.1-3*

Preliminary study illustrating various formulae for the definition of the continental shelf

[Original: English]
[18 April 1978]

DOCUMENT A/CONF.62/C.2/L.98

A preliminary study

At its 51st meeting on 29 June 1977, the Second Committee requested that the secretariat prepare a preliminary study showing, both on maps and in figures, the difference in area between the various formulae for the definition of the continental shelf. At that meeting a statement was made by the secretariat to the effect that it was understood that the study would be a preliminary one, including maps, and that the purpose would be to show both on maps and in figures the difference in area between various formulae for the definition of the continental shelf. The maps should show a 200-nautical-mile line around all elevations permanently above the surface of the sea, a line showing a 500-metre isobath, a line showing the outer edge of the margin and lines illustrating the effect of the Irish formula.¹¹ The 200-nautical-mile line on the maps should be drawn utilizing known baselines, or where baselines either had not been established or were not known, the line would be based on the configuration of the coast. It was clear the secretariat would have to use such information as it might be able to secure in the public domain or information furnished by delegations. The secretariat

*Document A/CONF.62/C.2/L.98/Add.2, containing the maps showing the results of the various formulae for the definition of the continental shelf, is not reproduced in this volume.

¹¹Contained in an informal text submitted by Ireland at an informal meeting of the Second Committee during the fourth session of the Conference. The relevant part of the text reads as follows:

"2. The continental margin comprises the submerged prolongation of the land mass of the coastal State, and consists of the sea-bed and subsoil of the shelf, the slope and the rise. It does not include the deep ocean floor nor the subsoil thereof.

"3. For the purpose of this Convention, the coastal State shall establish the outer edge of the continental margin wherever the margin extends beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured, by either:

"(a) A line delineated in accordance with paragraph 4 by reference to the outermost fixed points at each of which the thickness of sedimentary rocks is at least 1 per cent of the shortest distance from such point to the foot of the continental slope; or

"(b) A line delineated in accordance with paragraph 4 by reference to fixed points not more than 60 nautical miles from the foot of the continental slope.

In the absence of evidence to the contrary, the foot of the continental slope shall be determined as the point of maximum change in the gradient at its base.

"4. The coastal State shall delineate the seaward boundary of its continental shelf where that shelf extends beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured by straight lines not exceeding 60 nautical miles in length, connecting fixed points, such points to be defined by coordinates of latitude and longitude."

would not be expected to assume responsibility for the information so obtained beyond identifying the nature of the source.

Should the Committee decide to request a preliminary study along these lines, the secretariat would do its utmost to have the results ready by the end of the current session. However, the secretariat felt bound to point out that those results would necessarily be incomplete and would only be indicative of orders of magnitude with a substantial probability of error. Naturally, the secretariat would appreciate as much assistance as delegations in a position to do so could provide, assuming that such was the wish of the Committee.

In subsequent discussion, the secretariat was also asked to take into account the criterion of exploitability.

On 12 October 1977, the Special Representative of the Secretary-General addressed a note to the representatives of States participating, informing them that the secretariat had not been able to complete the study during the sixth session, but expected to do so before the seventh session. He expressed the hope that any information available would be furnished to the secretariat in time to be taken into account. Copies of this note were also forwarded to other organizations in the United Nations system.

It was clear from the outset that the secretariat itself would not be in a position to secure from within the necessary expert knowledge and information required for the purpose of this study. After reviewing the possible sources of external assistance, and having regard to the commitment made to prepare the study using available financial resources, the secretariat entered into an agreement with the Lamont-Doherty Geological Observatory of Columbia University (United States) for preparation of the maps and other information required. This institution was selected because it appeared to have the best single collection of published data available and had the necessary expertise and cartographic capability. The secretariat also accepted with appreciation assistance offered jointly by the Intergovernmental Oceanographic Commission (IOC) of UNESCO and the International Hydrographic Organization (IHO). Experts from the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans (GEBCO), nominated by these two bodies, reviewed available data and the maps in draft form. The maps attached to this study reflect the advice and assistance given by these experts. Materials provided by Governments, in many cases informally, were made available to the experts engaged in this task.

The secretariat wishes to emphasize that the present study would only be indicative of areas of magnitude with a substantial probability of error. The maps illustrate the application of the various formulae proposed for the definition of the continental shelf and other data which the secretariat

undertook to cover in response to the request made in the Second Committee.

The secretariat has merely sought to have these lines illustrated without in any way bearing upon other matters of a possibly contentious nature such as, for example, questions of delimitation or territorial sovereignty. To this end the maps omit, for example, all indications of frontiers on land. Contrary to expectations at the time the decision was taken in the Second Committee to request the study, it was found impracticable to take baselines into account in drawing the 200-nautical-mile line. The difficulty of establishing at the outset how all Governments have drawn such baselines (apart from the problem of possible implications regarding issues of delimitation), made it clear that more resources and time than were available would be required. The 200-nautical-mile line was therefore drawn about all elevations above mean high water, regardless of what the effects of applying other relevant provisions of the informal composite negotiating text might be. One consequence is that the 200-nautical-mile line, as illustrated, in many instances no doubt covers a smaller area than would one drawn proceeding from baselines established as prescribed in the negotiating text. In other words, the area falling under the formulae applying beyond 200 nautical miles as illustrated in the maps in this study, would be less if baselines were used, and the area within the 200-nautical-mile line would be larger.

The maps show: (1) the 200-nautical-mile line in black with a capital T at appropriate intervals; (2) the 500-metre isobath in black dots, where it extends beyond 200 nautical miles; (3) the delineation of the continental margin all around the world in a blue line with a capital M at appropriate intervals; (4) the foot of the slope with a brown line and a capital S at appropriate intervals; where the foot of the slope and the continental margin lines come together, the brown line stops but the capital S in brown continues; (5) the Irish formula delineated by reference to fixed points not more than 60 nautical miles from the foot of the continental slope, in an orange solid line outside the 200-nautical-mile line, marked with the letters Ib; (6) the Irish formula, following paragraph 3(a) of the Irish text, by reference to the outermost fixed points at each of which the thickness of sedimentary rocks is at least 1 per cent of the shortest distance from such point to the foot of the continental slope has been delineated outside the 200-nautical-mile line in a red line, further identified by the letters Ia; (7) the area lying seaward of the 200-nautical-mile line up to the delineation of the continental margin is shaded in blue. In spite of the lack of data and of difficulties in interpretation in many areas, continuous lines have been drawn world-wide in order to calculate areas.

The decision was made to use a Mercator projection, both because it allowed most of the information to be placed on one sheet and because it is generally familiar. It must be borne in mind, of course, that this projection produces distortions which makes areas in the high latitudes appear larger than similar areas on the equator.

In considering what treatment was called for in respect of the criterion of exploitability, the secretariat noted that the main problem concerned the precise meaning to be attached to this term. It appears that drilling into the sea-bed has been demonstrated as feasible at any known depth of water and that it is similarly feasible to retrieve surficial material at any depth. However, the question of whether such exploitation would be economic was not one which the secretariat felt called upon to consider.

The data used as a basis for the lines illustrated are, it must be emphasized, extremely irregular in both quantity and quality between different areas. In particular, the seismic data available from the Arctic giving thickness of sedimentation are very limited, since seismic profiling cannot be carried out over areas covered by permanent ice pack in the

same manner as in open water. Hence the Irish formula Ia is not portrayed in the Arctic Ocean. There is no doubt much published material which could not be taken into account in the preparation of the maps due to limitation of time and expense. There is also reason to believe that much information not yet made public exists. Nevertheless, the opinion of the experts involved is that the data base employed is large enough to warrant the view that the illustrations given are a reasonable approximation, particularly in relation to the scale of the maps on which they are shown and that the concepts of delineation implied in the formulae are, in principle, supportable given an adequate data base. This being said, however, it must also be stressed that the lines are only illustrative, and that they would require more careful investigation before they could be used as a basis for charting lines dividing national and international areas. Such charting would have to use much greater detail than is given in this study, and for such detail to be possible in many areas the data base employed here would have to be expanded substantially. *A fortiori*, the secretariat considers that these illustrations should not be taken as having any bearing on issues of a bilateral character.

The maps are diagrammatic only. The study, including the maps, has no legal implications, and should not be interpreted as prejudicing the position of any delegation or State as regards the applicability of the various formulae to specific areas or in any other way.

The secretariat hopes to be in a position, during the seventh session of the Conference, to provide calculations of the various areas encompassed on these maps. It wishes to express its appreciation of the valuable assistance given in the preparation of this preliminary study by the Lamont-Doherty Geological Observatory, and in particular by Mr. William Ryan, as well as by Messrs. A. S. Laughton and Robert L. Fisher, the experts nominated from GEBCO to review the draft.

DOCUMENT A/CONF.62/C.2/L.98/ADD.2

Calculation of areas illustrated beyond 200 miles in document A/CONF.62/C.2/L.98/Add.1

[Original: English]
[3 May 1978]

Area of Irish formula Ia beyond 200 miles (not including the Arctic Ocean)	2 584 000 square nautical miles
Area of Irish formula Ib beyond 200 miles (including the Arctic Ocean)	2 618 000 square nautical miles
Area of 500-metre isobath beyond 200 miles	57 500 square nautical miles
Area between base of margin and 200 miles where the margin extends beyond 200 miles . .	8 204 000 square nautical miles

DOCUMENT A/CONF.62/C.2/L.98/ADD.3

Communication received from the Secretary of the Intergovernmental Oceanographic Commission

[Original: English]
[28 August 1978]

As stated in document A/CONF.62/C.2/L.98, a review was carried out of the map in document A/CONF.62/C.2/L.98/Add.1 whilst still in draft form, by experts nominated by the secretariats of the Intergovernmental Oceanographic Commission and the International Hydrographic Organization.

The IOC and IHO secretariats have now informed the Conference secretariat that since the publication of the map, a number of errors and omissions have been brought to their notice and they have requested that these be promulgated to the Conference for information.

1. The scale of the map is 1:30,000,000 at the equator. The polar stereographic inset is at a scale of 1:35,000,000.

2. In approximate position 3°S, 40°W, the 200-mile arc described from the coast of Brazil is about 60 miles short of 200 miles.

3. In approximate position 9°S, 46°E, the Aldabra (Seychelles) group of islands and appropriate 200-mile arcs are not shown.

4. In the area enclosed by 30°-50°S, and 170°-180°W, the 200-mile arcs are short by about 50 miles.

5. A triangle of high seas measured from the Antipodes, the Campbell Islands and New Zealand within the New Zealand economic zone, in approximate position 49°S, 173°E, is not shown.

6. Manus Island (Papua New Guinea) and the 200-mile arc are not shown.

7. Yap and Ngulu Islands (Caroline Islands), in approximate position 8°N, 138°E, and appropriate 200-mile arcs are not shown.

8. Namonuito Island group (Caroline Islands), in approximate position 7°N, 149°E, and appropriate 200-mile arcs are not shown.

9. The 200-mile arcs described about the Japanese islands of Oagari and Okino Oagari are short by about 30 miles (25°-29°N, 134°E).

10. The 200-mile arc described about Surtsey (Iceland), in approximate position 63°N, 21°W, is short by about 30 miles.

11. The 200-mile arc described about Geirfugladrangur (Iceland), in approximate position 64°N, 23°W, extends beyond 200 miles.

12. The 200-mile arc has been omitted from Belle Isle in approximate position 53°N, 55°W.

13. Off-lying islands along the Labrador coast are not shown and the 200-mile envelope has been developed from the mainland coast.

14. The 200-mile arc in approximate position 60°N, 58°W is short by about 30 miles.

15. Blue stipple over margin beyond 200 miles along the coast of North-West Africa has been omitted.

16. Christmas Island, in approximate position 10°30'S, 105°30'E, is shown about 100 miles north of its correct position.

17. Maria Augustina Bank, a submerged feature in approximate position 14°S, 105°E, has been given a margin and a foot of the slope contour; these should be deleted.

18. Paragraph 3 (a) of the Irish formula has not been applied to the area westward of the Andaman Islands in the Bay of Bengal. As this formula is based on the thickness of sedimentary rocks for its application, ridges or trenches should have no effect if the thickness of sediments is sufficient to warrant its application. Isopach charts, including those of the Lamont-Doherty Geological Observatory, show thick sediments overlying the Ninety East Ridge north of latitude 9°30' North and merging with the sediments in the Bay of Bengal sedimentary basin. The formula is therefore applicable from the foot of the slope bordering the Bay of Bengal whether it relates to mainland or islands. It is also noted that a discrepancy of some 200 miles exists in the northern limit of the Ninety East Ridge shown on the map.

19. The 200-mile arcs described about Sakhalin Island in the Sea of Okhotsk are concave instead of convex.