Verklaring Kolonel G.H. Sedney

Ik, Glenn Herman Sedney, geboren op 27 september 1954 te Paramaribo, woonachtig aan de Moengolaan no1 te Paramaribo, verklaar als volgt:

1. In mei/juni 2000 was ik de Bevelhebber van het Nationaal Leger van Suriname.

Ik ben na de middelbare school in 1977 naar Nederland uitgezonden voor het volgen van een officiersopleiding in Breda. Nadat ik die opleiding had voltooid ben in 1980 naar Suriname teruggekeerd en als 2e Luitenant ben ik toen pelotonscommandant bij de infanterie geworden. Een jaar later werd ik Officier belast met inlichtingen en veiligheid. Die functie heb ik vervuld tot juli 1984 en waarna ben ik uitgezonden naar Brussel als militair attaché. In 1987 ben ik, terug in Suriname, gaan werken op het Kabinet van de Chef Staf als plaatvervangend Chef Staf. In 1993 ben ik, in de rang van Kolonel Chef Generale Staf geworden en daarna in 1995 tot 2001 was ik bevelhebber van het Nationaal Leger.

2. Ik heb begin mei 2000 uit de pers vernomen dat Guyana bezig was, samen met een Canadese maatschappij, CGX, om voorbereidingen te treffen voor olieboringen in het gebied dat door Suriname wordt beschouwd als te behoren tot haar zeegebied. Ik meen me te herinneren dat de bron van deze berichten een voorman was van de politieke partij HPP, de heer Kisoensingh. Het was in de verkiezingstijd. Lt Kol de Mees, commandant van LUMAR (de gecombineerde lucht en marine eenheid van het leger) heeft toen contact met mij opgenomen en mij documentatie die van het internet gehaald was, gebracht of gezonden. Uit deze documentatie bleek dat de voorbereidingen waar in de pers gewag van werd gemaakt inderdaad gaande waren. Ik sprak in de volgende dagen bilateraal met verschillende van de personen uit legerleiding, onder andere Commandant de Mees en Chef Staf Slijngaard, over de eventuele consequenties van deze kwestie. Allemaal volgden we zo goed mogelijk in de pers de ontwikkelingen. Ik had nog geen contact terzake met de politieke leiding van het land.

3. Ik heb de kwestie laten plaatsen op de agenda van de vergadering van de legerleiding van 17 mei 2000. Op die vergadering was de algemene mening dat het leger niet met lede ogen zou mogen toezien dat illegale economische activiteiten in het gebied dat officieel als Surinaams gebied wordt beschouwd, zouden plaatsvinden. Het leger had een zelfstandige taak om te waken voor de integriteit van de soevereiniteit van Suriname en indien inbreuken daarop dreigden dienden wij ons erop voor te bereiden dat wij eventueel actie zouden moeten nemen.

4. Op 24 mei 2000 heeft drs Vreedzaam, die toen meen ik Hoofd van Internationale Juridische zaken was van het ministerie van Buitenlandse Zaken, voor de legerleiding en de staf van het leger een inleiding gehouden waarin hij de juridische aspecten van de kwestie heeft uiteengezet. Hij concludeerde dat de voorgenomen boringen vanwege Guyana binnen het zeegebied waarover Suriname soevereiniteit claimt onrechtmatig zouden zijn.

5. Verkiezingen waren op handen en de politieke partij HPP had de kwestie tot een verkiezingsissue gemaakt. Dit kan de reden zijn waarom de Regering aanvankelijk niet met vastbeslotenheid de zaak aanpakte. Binnen de legerleiding bestond het gevoelen dat wij er alles aan moesten te doen om niet politiek misbruikt te worden maar dat wij

MR. R.G. RODRIGUES
NOTARIS TE PARAMARIBO

wel ervoor moesten zorgen dat wij ons als leger op een behoorlijke manier van onze verantwoordelijkheid zouden kwijten.

6. Kort na 24 mei bereikten ons berichten dat het boorplatform inmiddels in Trinidad was aangekomen en naar de betreffende locatie in de Surinaamse wateren zou worden gesleept. Het probleem begon toen de volle aandacht te krijgen van de Regering en van het publiek. Met mij, als bevelhebber van het leger, werd evenwel vanuit de Regering formeel nog geen contact gemaakt. Vanuit het leger hebben we uit de informatie die we van het internet en de media haalden kunnen vaststellen hoe lang het zou duren om het platform vanuit Trinidad naar de locatie waar geboord zou worden te slepen. Ik kan me herinneren dat dit een aantal dagen was. Toen bekend werd dat het platform uit Trinidad was vertrokken heb ik na overleg met de rest van de legerleiding instructies gegeven aan de commandant van de LUMAR om vanaf dien regelmatig patrouillevluchten uit te voeren zodat we precies konden vaststellen wanneer het platform de Surinaamse wateren zou binnenvaren. Deze verkenningsvluchten zijn inderdaad uitgevoerd en mij is steeds het resultaat gerapporteerd. Deze resultaten gaf ik door aan de Minister van Defensie. Sindsdien was er toen contact met de burgerautoriteiten. Ik heb onder andere tezamen met commandant de Mees een bespreking bijgewoond op het ministerie van Buitenlandse Zaken waarop zowel drs Vreedzaam als de heer Jharap, toen de directeur van Staatsolie, aanwezig waren.

7. Op 1 juni 2000 was er een vergadering van de legerleiding en op die vergadering is de kwestie besproken en hoewel er nog geen bevestiging was dat het platform binnen de Surinaamse wateren was aangekomen is op die vergadering o.a. besloten om de marine in Nickerie te versterken.

8. Inmiddels was de kwestie een 'hot political issue ' geworden. Ik ben op een gegeven moment bij de President ontboden. Ik was daarbij vergezeld van andere leden van de legerleiding. Daar werd door de President uiteengezet dat de Surinaamse regering ernstig protest over de gang zaken bij de Guyanese regering had aangetekend maar de Guyanese regering daar kennelijk geen boodschap aan had. De President gaf daarop aan het leger de instructie om zich erop voor te bereiden om, indien Guyana inderdaad zou voortgaan met zonder toestemming economische activiteiten in Surinaamse wateren te ontplooien en daarmede de soevereiniteit van Suriname zou schenden, acties zouden moeten worden ondernomen om deze schending te voorkomen. De Regering vond het ook nodig om de samenleving te informeren dat zij niet stil zat maar actief bezig was om te trachten langs diplomatieke weg Guyana tot andere gedachten te brengen en dat intussen het leger de zaak in de gaten hield. Tegen deze achtergrond is toen door de Regering besloten dat er voorlichting op de televisie zou worden gegeven door de heer Alimahomed, toen directeur van het ministerie van Buitenlandse Zaken en dat ik hem daarbij zou ondersteunen. Tijdens die voorlichting heeft de heer Alimahomed uiteengezet dat op stellige wijze diplomatiek overleg met Guyana plaatsvond en ik heb gezegd dat het leger de zaak in de gaten hield en dat er tot dan geen sprake was van enige activiteit die een schending was van de soevereiniteit van Suriname.

9. De volgende ochtend, op 2 juni dus, was commandant de Mees bij mij om de gang van zaken te bespreken toen hij werd gebeld door kapitein Veldkamp vanuit het vliegtuig waarmee deze een verkenningsvlucht uitvoerde. Veldkamp rapporteerde dat hij had kunnen vaststellen dat het platform reeds in de Surinaamse wateren was en reeds zijn legs had uitgezet. Men was bezig het boorplatform op de locatie te stationeren. Ik heb

MR. R.G. RODRIGUES
NOTARIS TE PARAMARIBO

de President daarop meteen hiervan in kennis gesteld. De President gaf mij te kennen dat hij zich meteen met de Guyanese autoriteiten zou verstaan maar dat het leger zich verder op actie moest voorbereiden.

10. Ik heb ook de legerleiding meteen bij elkaar geroepen. In die bespreking heb ik eerst de stand van zaken uiteengezet, zowel ten aanzien van de aanwezigheid van het platform in de Surinaamse wateren als van mijn contacten met de President. Daarna hebben we de strategische en operationele aspecten van een eventuele missie besproken. Er is besloten dat er twee patrouilleboten zouden worden ingezet. De bewapening zou bestaan uit de persoonlijke bewapening van de bemanning en een groepswapen (MAG). In die vergadering is ook nagegaan wie het meest geschikt was om het operationele commando te voeren en op voorspraak van de commandant van de LUMAR werd dat de kapitein Jones. De instructie die de operationele leiding zou krijgen was dat hij in radiocontact moest proberen te treden met het boorplatform en dat hij in dat contact duidelijk moest maken dat het boorplatform zich in Surinaamse wateren bevond en zodoende illegale activiteiten ontplooide en daarom werden gesommeerd het gebied onmiddellijk te verlaten. Als daaraan gevolg zou worden gegeven was er verder niets aan de hand. Als geen gevolg werd gegeven dan zou de operationele commandant terug moeten koppelen met de basis om verdere instructies te krijgen. Mijn bedoeling was dat ik in dat geval mij met de President zou verstaan om te vragen hoe verder gehandeld zou moeten worden. Binnen de legerleiding hebben wij verder gesproken over wat die eventuele nadere instructies zouden kunnen inhouden. We hebben daarbij als een belangrijke factor gezien of er zich al dan niet bewapende manschappen aan boord van het platform zouden bevinden. De conclusie was dat er hoe dan ook geen geweld van Surinaamse kant gebruikt zou worden tenzij er sprake was van de noodzaak van zelfverdediging.

11. Als ik me goed kan herinneren ben ik kort na de vergadering door de President opgebeld en deze heeft me toen medegedeeld dat het diplomatieke overleg met de Guyanese regering nergens op uit was gelopen en dat de marine nu moest uitvaren om het platform te sommeren om zich uit Surinaamse wateren te verwijderen. Na de vergadering heb ik kapitein Jones ontboden. Ik heb hem op zijn verantwoordelijkheden gewezen en ik heb hem moed ingesproken. Ik heb hem gevraagd om deze boodschap ook over te brengen aan de manschappen waar hij tijdens de operatie het bevel over zou voeren. Ik ben later op de middag door commandant De Mees opgebeld met de mededeling dat de patrouilleboten gereed waren om uit te varen en ik heb toen de instructie te geven om de operatie uit te voeren.

12. In het begin van de operatie heb ik via het radiocontact dat door het op mijn kantoor geïnstalleerde communicatiecentrum met de patrouilleboten werd onderhouden, de gang van zaken kunnen volgen. Op een gegeven ogenlik is het contact uitgevallen en het is pas weer hersteld in de ochtend van 3 juni. Toen vernam ik dat het platform was gesommeerd om zich uit de Surinaamse wateren te verwijderen en dat men daarin had ingestemd. Wel had men gevraagd om meer tijd dan de aanvankelijk gegunde 12 uren. De patrouillevaartuigen hadden inmiddels koers gezet naar Nickerie met de bedoeling om later op de dag terug te keren naar de locatie om vast te stelen of inderdaad gevolg was gegeven aan de sommatie om te vertrekken. Later is mij gerapporteerd dat het platform inderdaad door twee sleepboten werd weggesleept.

13. In de periode tussen 24 mei en 2 juni heeft de Amerikaanse Ambassadeur belet bij mij gevraagd. Hij heeft mij te kennen gegeven dat hij waardering had voor de wijze

waarop Suriname tot dan voor haar belangen was opgekomen en dat hij niet in het geschil partij wilde kiezen of tussen beide wilde komen. Hij wilde ook niet indiceren welke acties Suriname wel of niet zou moeten nemen maar hij vroeg mij nadrukkelijk om indien tot actie zou worden overgegaan er rekening mee te houden dat er zich onder andere Amerikaanse burgers op het platform bevonden. Ik heb hem geantwoord dat hij zich over de veiligheid van de mensen aan boord geen zorgen behoefde te maken en ik had de indruk dat hij met die mededeling gerustgesteld was.

Aldus opgemaakt te Paramaribo, op 17 juli 2006.

G.H. Sedney

Gezien voor legalisatie van de handtekening van de heer Glenn Herman Sedney, geboren op 27 september 1954 te Paramaribo, houder van Identiteitskaart nummer DY 002971, die na lezing van deze akte onder ede heeft verklaard dat de verklaring vrijwillig en naar eer en geweten en naar zijn beste herinnering is afgelegd.

Paramaribo, 17 juli 2006.

MR. R.G. RODRIGUES NOTARIS TE PARAMARIBO

SF 2500

Mr.R.G.Rodrigues, notaris.

[translation from the original in Dutch]

Statement Colonel G.H. Sedney

I, Glenn Herman Sedney, born on 27 September 1954 in Paramaribo, residing at Moengolaan no 1 in Paramaribo, testify as follows:

1. In May/June 2000 I was the Commander in Chief of the Suriname Armed Forces.

After secondary school I was sent to the Netherlands in 1977 to attend an officers training course in Breda. After completing that course I returned to Suriname in 1980 and became an infantry platoon leader with the rank of Second Lieutenant. One year later, I was appointed Officer in charge of Intelligence and Security Affairs. I served in that position until July 1984, after which I was transferred to Brussels to serve as a Military Attaché. Back in Suriname in 1987, I worked as a Deputy Chief of Staff at the Cabinet of the Chief of Staff. In 1993, I became the Chief of General Staff with the rank of Colonel and from 1995 till 2001 I was Commander in Chief of the Armed Forces.

2. Early May 2000, I learned from the media that Guyana, together with the Canadian Company CGX, was preparing for oil drilling activities in the area which Suriname considers to be part of its maritime area. I think I remember that the source of this information was a prominent member of the political party HPP, Mr.Kisoensingh. It was election time. LtCol de Mees, then Commander of LUMAR (which stands for the combined unit of the armed forces' Air Force and Navy) contacted me at that time and brought or sent me documentation taken from the internet. From this documentation it appeared, that the preparations mentioned in the press, were indeed taking place. On the following days, I had bilateral talks about the possible consequences of this matter with several members of the Armed Forces Command, amongst others Commander de Mees and Chief of Staff Slijngaard. We all followed, as well as possible, the developments through the press. At this point in time, I was not yet in touch with the political leadership of the country on this matter.

3. I saw to it that this matter was put on the agenda of the meeting of the Armed Forces Command of 17 May 2000. At that meeting the general view was that the Armed Forces should not watch idly that illegal activities would take place in the area that officially was considered Suriname territory. The Armed Forces' autonomous duty was to watch over the integrity of the sovereignty of Suriname and that in case of infringements we should prepare for possible actions to be taken.

4. On 24 May 2000 Mr. Vreedzaam, then, I think, Head of the Department of International Legal affairs at the Ministry of Foreign Affairs, held a lecture for the Armed Forces Command, about the legal aspects of the matter. He concluded by saying that the intended drillings by Guyana within the sea area over which Suriname was claiming sovereignty, would be illegal.

5. Elections were due and the political party HPP had made the matter an election issue. This could have been the reason why the Government did not initially deal with the issue in a

decisive way. Within the Armed Forces Command the feeling was that we should take great care not to be misused politically but at the same time we did have to make sure that, as armed forces, we would carry out our responsibilities in a proper manner.

6. Shortly after 24 May, information we received was that the drilling platform had reached Trinidad and was being towed to the relevant locations in Suriname waters. Then the matter started to get the full attention of the Government and the general public as well. However, with me, as Commander in Chief of the Armed Forces, no formal contact had been made yet by the Government. Within the armed forces we had worked out, from the information received through internet and the media, how long it would take the platform to be moved from Trinidad to the location where the drilling activities were planned. I recall it would take a number of days. When it was known that the platform had left Trinidad, and after having consulted with the Armed Forces Command, I issued instructions to the Commander of LUMAR to start conducting regular patrol flights from then onwards, which would enable us to establish precisely the time when the platform would enter Suriname waters. These patrol flights were indeed conducted and the results were reported to me accordingly. I reported these findings to the Minister of Defence. Since that time contact on the matter was established with the civilian authorities. Among other things I then was present at a meeting at the Ministry of Foreign Affairs, together with Commander de Mees, and at that meeting Mr Vreedzaam and Mr Jharap, then director of the State Oil Company, were also present.

7. On 1 June 2000 a meeting was held of the Armed Forces Command in which the matter was discussed, and although there was no confirmation yet as to the arrival of the platform in Suriname waters, the meeting (amongst other things) decided to reinforce the Navy in Nickerie.

8. In the meantime, the matter had turned into a "hot political issue". I was called in by the President. I was at that time accompanied by other members of the Armed Forces Command. The President then explained that the Suriname Government had vigorously protested with the Guyanese Government against this course of affairs, but he also said that it looked like the Government of Guyana apparently thought it was no concern of theirs. The President then gave the Armed Forces instructions to prepare for action as, in case Guyana indeed would continue to undertake economic activities in Suriname waters without permission and thus would infringe on Suriname's sovereignty, such infringements would have to be prevented. The Government also deemed it necessary to inform society at large about the fact that it was not sitting idle, but that it was actively trying to persuade Guyana through diplomatic channels to reconsider and that, in the meantime, the army was watching closely. Against this background, the Government then decided that information should be given to the public on television by Mr. Alimahomed, then Permanent Secretary at the Ministry of Foreign Affairs, and that I should assist him. At these informative sessions, Mr. Alimahomed explained that there were firm diplomatic deliberations going on with Guyana and I told the public that the armed forces were keeping an eye on things and that up till then, there were no indications yet as to any activity infringing on the sovereignty of Suriname.

9. The next morning, so on 2 June, while Commander de Mees was discussing the course of matters with me in my office, he was called by Captain Veldkamp from the plane in which he was conducting a reconnaissance flight. Veldkamp reported that he had been able to establish that the platform had already entered Suriname waters and that it had already extended its legs.

They were busy installing the drilling platform at the site. I immediately notified the President.
9. The President then advised me that he would get in touch immediately with the Guyanese authorities but that the armed forces should get ready for action.

10. I also called a meeting of the Armed Forces Command. In that meeting I first explained the state of affairs, as to the presence of the platform in Suriname waters and as to the contacts I had had with the President. Thereafter we discussed strategic and operational aspects of an eventual mission. It was decided that two patrol vessels would be deployed. Weaponry should consist of the personal crew weapons and the group weapon (MAG). In that same meeting, consideration was given as to who would be the most suitable candidate for the operational command and upon intercession of the Commander of LUMAR, Captain Jones was chosen. The instruction for the operational commander was that he should on approaching the platform try to establish radio contact with the drilling platform and that in that radio contact he should be clear in telling them that they were in Suriname waters, hence involved in illegal activities and therefore were to leave this area immediately. If they would comply with this order there would not be anything wrong. But in the event that they would not comply with the order, the operational commander should then touch base for further instructions. It was my intention that in that case I would then consult with the President to ask what further action should be taken. Within the Armed Forces Command, we have discussed what those further instructions could possibly entail. During these talks we thought it an important factor whether or not there would be armed personnel on the platform. We concluded that Suriname would not use force in any case, unless it was called for because of the necessity of self-defence.

11. If I remember well, shortly after the meeting I was called by the President who informed me that diplomatic consultations with the Guyanese Government were unsuccessful and that the Navy now had to set sail to the platform to order them to leave Suriname's waters. After the meeting I sent for Captain Jones. I pointed out his responsibilities to him and encouraged him. I also asked him to convey this message to the entire crew, over which he was in command during this operation. Later that afternoon I was called by Commander de Mees informing me that the patrol vessels were ready to set sail and I then gave the order to carry out the operation.

12. In the first part of the operation I was able to follow the course of actions via radio contact which was established with the patrol vessels through the installed communication centre in my office. At a certain point in time radio contact was lost and only got restored in the morning of 3 June. Then I learned that the platform had been ordered to leave Suriname waters and that they had agreed to do so. They however had asked for more than the initially allowed period of 12 hours. Meanwhile, the patrol vessels had set course to Nickerie with the intention to return to the site later that day to see if indeed the platform was complying with the order to leave. Later that day, it was reported to me that the platform was indeed being towed away by two tugs.

13. In the period 24 May – 2 June, the American Ambassador had requested if he could see me. He told me that he had appreciated the manner in which Suriname had defended its interests up to then and that he did not wish to take sides or intervene in the dispute. Neither did he wish to indicate which actions Suriname should or should not take but he asked me explicitly, in case of action to be taken, to take note of the fact that there were also American nationals on the

platform. I told him not to worry about the safety of the people on board and I got the impression that his mind was set at ease with this assurance.

Thus drawn up at Paramaribo, 17 July 2006

[signature]

G.H. Sedney

Seen for authentication of the signature of Mr. Glenn Herman Sedney, born on 27 September 1954 at Paramaribo, bearer of Identity Card DY 002971, who after having read this act has declared under oath that the statement has been made voluntarily and in good faith and to his best recollection.

Paramaribo, 17 July 2006

[seal and signature]

Mr. R.G. Rodrigues
notary

Document A/CONF.13/13

EXAMINATION OF LIVING RESOURCES ASSOCIATED WITH THE SEA BED OF THE CONTINENTAL SHELF WITH REGARD TO THE NATURE AND DEGREE OF THEIR PHYSICAL AND BIOLOGICAL ASSOCIATION WITH SUCH SEA BED

MEMORANDUM BY THE FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

(Preparatory document No. 10)

[Original text: English]
[6 November 1957]

CONTENTS

FOREWORD

The United Nations has requested the Food and Agriculture Organization to prepare a statement on the relations of living aquatic resources with the sea bed of the Continental Shelf as defined in article 67 of the articles concerning the law of the sea, adopted by the International Law Commission at its eighth session, in 1956. The following paper has been prepared in answer to that request and although not an exhaustive treatment of the question it does endeavour to show fully the complexities of the situation under examination. After indicating the kinds of relation that may exist between an individual organism and the bed of the Continental Shelf, it examines the changes in this relation that may take place throughout the life of an individual organism. It then, making use of the very extensive work on this subject, submits a classification of the organisms normally occurring as members of shelf communities in adult phase with an indication of the habitat, etc., of the juvenile phases of these adults.

Every effort has been made in preparing this paper to preserve a simplicity of language, but the subject is such that it has been necessary to employ certain terms which may not be familiar to the lay reader. It has, therefore, been thought advisable to append a brief glossary.

EXAMINATION OF LIVING RESOURCES ASSOCIATED WITH THE SEA BED OF THE CONTINENTAL SHELF WITH REGARD TO THE NATURE AND DEGREE OF THEIR PHYSICAL AND BIOLOGICAL ASSOCIATION WITH SUCH SEA BED

In considering the relations of living organisms with the continental shelf it is important to remember that this shelf is not merely a platform within or upon which there is a resting place for an organism for part or all of its life. The position of the shelf in relation to the continental (or island) land mass on the one hand, and to the continental slope and the abyssal bed on the other, causes it to exercise an influence on the play of hydro-dynamic forces in the water-masses that overlie it, and these are related to the forces operating in adjacent water-masses, both those of the ocean and the water outflowing from the continent. Moreover, the shelf receives, and provides a storage place for, a great diversity of materials. As a consequence the shelf is not merely a passive platform, but contributes to the creation of particular physical and chemical conditions that are of considerable significance to the living organisms. Conversely, the organisms exercise some influence on the characteristics of the shelf and contribute to creation of a milieu that is unique to those areas of the earth's surface where the shelf exists. Such facts are of importance because of their relation to the simple yet easily overlooked fact that whatever association aquatic organisms have with the shelf proper, they nevertheless live in water. Discussion of these associations therefore must recognize the role of the waters overlying the shelf as well as that of the physical shelf.

A discussion of the association of living aquatic resources with the continental shelf should then begin with an analysis of the types of relation or connexion that may exist, such relations being direct with the physical shelf proper, or indirectly with it through the

overlying water. The importance of this analysis will become clear when it is recognized that the existence of each organism may involve several different kinds of relation, and that the pattern of relations may vary as between different life phases. The value of this analysis will be made even more apparent when we come, later, in this paper, to consider a conventional classification of the organisms that make up bottom communities.

The relations involved can be classified with respect to the organism's requirements (1) for appropriate living space, (2) for its general physiological functions, (3) for its food and nutrition and (4) for reproduction. Although nutrition and reproduction, of course, are physiological functions and could be included under the second heading, and conversely, the second heading could be divided into many particular functions, we believe that the present plan is most convenient for present purposes, and most clearly reveals the nature of the relations involved. This plan can be elaborated, as follows:

A. Living space

The organism lives:

(*a*) Within bottom materials,

(*b*) On bottom materials, by attachment,

(*c*) On the bottom surface, lying,

(*d*) On the bottom, but moving,

(*e*) In the water overlying the shelf.

B. General physiological functions

The organism finds physical and chemical conditions appropriate to its metabolism, movement and behaviour; included are factors such as temperature, salinity, light-intensity, water movement, and the nature and particle-size of the bottom materials.

C. Nutrition

Food supply of the organism is provided by:

(*a*) Bottom detritus,

(*b*) Bottom living organisms,

(*c*) Organisms that live in shelf water.

D. Reproduction

The organism finds:

(*a*) Conditions for maturation and spawning only on the shelf,

(*b*) Favourable situation for placement of eggs in the bottom material or on it,

(*c*) Conditions for larval development (after hatching) only on the shelf and in the water above it.

These organisms that have a "living-space" dependence on the shelf (especially those that live within, or fastened to bottom materials) find there, also, their general physiological nutritional and reproductive requirements, and thus are completely dependent upon the shelf. For this reason where examples are given of these relations, in Table 1 below, we combine the spatial and physiological relations. In contrast, other organisms have only one or more of the other relations with the shelf, as, for example, by visiting it for a brief period to spawn; nevertheless the importance of these other relations to the organism should not be underestimated. The denial or destruction of a breeding ground could presumably lead to the extinction of the stock that made use of it.

In only very few species of aquatic organisms is the entire life of each individual spent in close association with the shelf sea bed and the water lying immediately above it; in most organisms there is a free-swimming phase, in middle or surface waters. However, since in most cases the conditions of life for such a pelagic phase are found only in shelf waters, there continues to be for them a necessary and dependent relation between the organism and the shelf even in the free-swimming phase. This pelagic phase probably is a distribution mechanism which at the time may be very wasteful, because often large numbers of pelagic larvae drift from the shelf and are doomed to die.

TABLE 1 A

Examples of different types of relation of eggs with the shelf

Living Space (and General Physiological Functions)	
1. Within bottom	Eggs deposited in nests or cavities (rare). E.g., the amphipod *Corophium arenarium* deposits eggs in small buried brood-tubes.
2. Fastened to bottom	Eggs fastened to stones, or vegetation (e.g., Pacific herring), deposited in capsules, fastened to substratum (e.g., Periwinkle, *Littorina litorea*), or in gelatinous layers fastened to substratum (e.g., *Littorina obtusata*).
3. Surface of bottom and water immediately above it	Eggs deposited loose on bottom (e.g., Atlantic herring), or in gelatinous masses (e.g., Nemerteans), or in capsules (e.g., rays) or encrusted with sand (e.g., *Naticidae*). Brood protection common.
4. Supernatant waters at various depths	Many species, from all taxonomic groups of neritic, oceanic and benthonic animals have planktonic (freely floating) eggs; (e.g., nearly all starfish (echinoderms) and clams (bivalves); most *Actinia*, several polychaetes).

TABLE 1 B

Examples of different types of relation of larvae and young with the shelf

Living Space (and General Physiological Functions)	
1. Within bottom	This is a rare relation, found in the fauna of sand and of the intertidal zone. E.g., *Bledius spectabilis* and eunicid of polychaeto-*Diopatra neapolitana.*
2. Fastened to bottom	This also is a rare relation (e.g., a few tunicates).
3. Surface of bottom and water immediately above it	All non-pelagic larvae, e.g., larvae of most sand-fauna (e.g., ostracods, copepods), the young of haddock and of species whose young develop in egg-capsules deposited on bottom.
4. Supernatant waters at various depths	Planktonic larvae and young of majority of shelf organisms. (Most larvae feed while living planktonic life, some larvae however do not feed, but are planktonic only for distribution.*)
Nutrition	
1. Bottom detritus	Relatively rare (e.g., the feeding of settled larvae and those developed in the bottom substrata).
2. Bottom organisms	E.g., the feeding of young of haddock, and of the young of most organisms with non-pelagic larvae.
3. Neritic nekton and plankton . . .	Majority of pelagic larvae feed on phytoplankton, some exclusively on zooplankton (e.g., decapod larvae).

* That is to say, the significance of their sojourn in the planktonic community lies in the distribution brought about by the transport of the plankton by currents, sometimes resulting in the plankton being carried into unfavourable situations where it dies.

TABLE 1 C

Examples of different types of relation of mature animals with the shelf

Living Space (and General Physiological Functions)	
1. Within bottom	Organisms buried in bottom material through which they can move ; or living in cavities or holes e.g. certain molluscs ; or in tubes they have constructed e.g. worms.
2. Fastened to bottom	Organism with root or anchorage in the bottom, or with outer skeleton cemented or in some way fastened to rock or other hard bottom.
3. Surface of bottom and water immediately above it	Immobile organisms lying on bottom (forams and some oysters) ; partially mobile but not swimming.
4. Shelf-waters at various depths . .	Strictly neritic forms, which include the majority of demersal fish.
Nutrition	
1. Bottom detritus (and micro-organisms living in it)	Most animals which are buried in the sediment feed on the detritus ; there are also animals which pick detritus particles from the surface of sediment (e.g. polychaetes (worms), gastropods (shellfish), some decapods (crabs) etc.).
2. Bottom organisms	Hunting animals, e.g. starfish, species of fish (e.g. plaice and cod) feed on small bivalves and crustaceans.
3. Neritic nekton and plankton . . .	Many sessile animals, e.g. clams, oysters etc. (filter feeders and " lurkers ") ; animals which visit bottom for rest and protection (e.g. shrimp) ; many fish species.
Reproduction	
1. Maturation and spawning	Many viviparous organisms and organisms which have brood protection, are benthonic because, perhaps, of a need for support. Many otherwise pelagic species spawn on coastal areas.
2. Deposition of eggs	In bottom (rare), loose on bottom in capsules or gelatinous masses, fixed to it, with gelatinous masses or capsules fixed with strings, or deposited in cavities.
3. Embryonic development	Brook protection is common among benthonic organisms. In pelagic larvae development occurs in the pelagic stage. Waters overlying the shelf usually have higher turbulence, which is important for pelagic larvae and young.

We have referred above to the existence of a special shelf (or neritic) environment, established by virtue of the presence and particular form of the shelf in relation with the continental land-mass on one hand and with oceanic water masses on the other; we also referred to the contribution made by the living organisms to the particular characteristics of this environment. It is necessary at this point to say something further about these two aspects.

Firstly, with respect to the identity (and in some cases autonomy) of a shelf environment. As indicated in earlier paragraphs, it should not be thought that there is to be found overlying the shelf a mass of water that derives its characteristics exclusively from the shelf and remains unaffected by influences exerted by water masses and current systems of the oceanic side. On the contrary, the shelf water characteristics may be very considerably affected by the oceanic waters, as indeed they are by the outflow from the continent. Again, the limits of a "shelf environment" may not be assumed to coincide with the limits of the shelf itself, as that might be defined in geographic and geological terms; instead, the limits may extend seawards beyond the edge of the shelf, or be confined landwards, according to the interplay of oceanic continental influences.

Secondly, with respect to the part played by aquatic organisms in determining the characteristics of the shelf and its overlying waters. In perhaps the most obvious case, the reef-building corals make very great bottom structures; other organisms make similar incrustations, still others contribute, by their dead-shells, to the formation of enormous deposits; in a different kind there are the rock-boring organisms. Of quite different significance is the presence of a considerable population of micro-organisms living on the surface and in the superficial layers of sediments; these include bacteria, benthonic diatoms, and other forms, all of which serve as food for filter-feeding organisms. Finally, we may not overlook the effect on the water of the physiological activity of the great mass of living material which is feeding, respiring and excreting, and thus causing a constant flux in the chemical characteristics of this water.

Having given in Table 1 examples of the various kinds of relation, in each life phase, regardless of any connexion between successive stages, we now give, in Table 2, examples of the changing pattern of relations as between the life phases of an individual organism.

TABLE 2

The association with shelf of various representative organisms during different phases of life

Organism	*Eggs*	*Larvae and young*	*Adults*
Sponges and Hydroids			
(general)	Usually pelagic. Asexual reproduction also occurs.	Short pelagic life of larvae.	Fixed on rocky bottom or on shells, plants, etc. Filter feeders of suspended matter and plankton.
Ficulina ficus	Pelagic (asexual reproduction also occurs).	Pelagic (relatively short time).	The young settle on empty mussel shells (usually *Astarte*) which lie loose on the bottom around them.
Cliona celata	Pelagic.	Pelagic (relatively short time).	Burrows into limestone or into great mussel shells.
Tubularia larynx	Brood protection.	Pelagic.	Fixed on rocky bottom or on stones lying on bottom.
Corals			
(general)	Asexual reproduction common; pelagic eggs also occur.	Mostly pelagic.	Usually fixed to bottom or on hard objects on it.
Ceriantharia	Pelagic.	Pelagic, feeding on plankton.	Usually live in sand. Important as fish food. Detritus feeders.
Lophohelia prolifera . .	Mostly asexual reproduction by budding.	The larvae of sexual production pelagic ?	Fixed to the bottom. Reef-building coral in deep cold waters.
Sagartia troglodytes . . .	Pelagic in some localities, viviparous or larviparous in other places.	Pelagic eggs develop into pelagic larvae that feed on plankton. Viviparous larvae are benthonic crawling around the bottom.	Fixed to hard bottom or to hard objects on it.
Nemertines (worms)			
(general)	Usually in lumps on the bottom, but many species have pelagic eggs.	Species with non-pelagic development are rare; species with pelagic larvae,* some of which feed on plankton, are common.	Live mostly on bottom, but can also move through water; most species live among seaweeds. Feed on detritus and small algae. Many are carnivorous, attacking Polychaetes.
Lineus ruber	Deposited in lumps in a green gelatinous mucus on the bottom.	Non-pelagic larvae develop on the bottom.	Lives on muddy bottom in shallow water. Feed on detritus and small algae.

* The asterisk refers to larvae that do not take in food, but derive their nourishment from the remaining yolk material of their egg. Such larvae are known as lecithotrophic.

TABLE 2 (*continued*)

Organism	*Eggs*	*Larvae and young*	*Adults*
Cephalothrix linearis	Deposited on the bottom.	Pelagic.*	Lives usually among sea-weeds.
Cerebratulus marginatus	Deposited on the bottom.	Free swimming feeding on plankton.	Lives in deeper waters on hard bottom. Can also swim in the water.
Bryozoa (sea mosses) (general)	Mostly viviparous, but egg-laying species also occur.	Short time pelagic larvae * are most common, but larvae of few egglaying species are long time pelagic feeding on plankton.	Fastened, mostly on hard bottom. Filter feeders.
Alcyonidium albidum	Pelagic ?	Pelagic feeding on plankton.	Fastened on hard bottom. Filter feeders.
Flustella hispida	Pelagic ?	Pelagic.*	Fastened on sea-weeds.
Polychaetes (worms) (general)	Few viviparous. Usually eggs fastened to the opening of tubes or are truly pelagic. Asexual reproduction also occurs. Some species can change the mode of reproduction according to the surrounding conditions.	Mostly pelagic and planktotrophic. Larvae of non-pelagic development in about 25% of species. Pelagic larvae * also occur. Polychaete larvae are eaten by herring, actinians, amphipods and Cumacea.	Mostly live in bottom materials. Some species can leave the bottom for spawning in water mass. Detritus feeders.
Scoloplos armiger	Laid in gelatinous, pearshaped cocoons and attached to the sand by a rough string.	Larvae hatch from the cocoon in the crawling stage, without any pelagic life.	Lives in mud and muddy sand. Catch microfauna and organic detritus. Very important as food for demersal fish.
Nereis diversicolor	Either loose on the bottom or pelagic.	Short time pelagic.*	Lives in sandy mud. Leave the bottom during spawning, which occurs near the surface.
Nereis pelagica	Both pelagic, and lying on the bottom.	Developing on bottom in a crawling stage or pelagic feeding on plankton.	Lives on rocky bottom, but can also swim in the water.
Nephthys caeca	Ova are well developed in the coelom of a female before release into the water.	Long time pelagic feeding on plankton.	Digs into the mud, but can also swim in the water.
Crustaceans (shrimps, lobsters, etc.)			
HARPACTICOIDS	Mostly pelagic.	Mostly pelagic and feeding on plankton.	Live mostly on all kinds of bottom, but can also swim ; mostly detritus feeders.
CIRRIPEDS	Brood protection common.	Usually pelagic.	Fixed on stones, ships, etc. Filter feeders.
CUMACOA	Brood protection common.	Usually pelagic.	Live mostly on bottom, but occur sometimes in water mass. Important as fish food ; detritus and plankton feeders.
AMPHIPODS	Brood protection common.	Mostly pelagic.	Most species pelagic, some species on bottom substrata with ability to swim (e.g. *Gammarus locusta* on sea-weeds), some living in bottom substrata (e.g. *Hippomedon, Haploops*, etc.). Bottom living species are detritus feeders.
DECAPODS (general)	Brood protection and also pelagic eggs.	Most larvae have long pelagic life and are feeding on smaller zooplankton organisms.	Mostly live on bottom as well as in the water above, but also crawling only on bottom. Many species of great economic importance. Mostly detritus and plankton feeders.
Pandalus borealis (shrimp)	Brood protection.	Pelagic feeding on plankton.	Lives mainly on bottom, feeds on smaller organisms and partly on organic detritus. During the night may swim around.

* See footnote p. 190.

TABLE 2 (*continued*)

Organism	*Eggs*	*Larvae and young*	*Adults*
Carcinus maenas (beach crab)	Part-time brood protection. Eggs are released in an advanced state of development.	Pelagic feeding on plankton.	Lives usually on sandy bottom in shallow water.
Eupagurus bernhardus (eremite crab)	Brood protection.	Pelagic.	Lives in empty gastropod shells (e.g., *Littorina*) crawling around the bottom in this shell ; important fish food.
Homarus vulgaris (lobster)		Pelagic.	Lives under stones and among seaweeds. Economically exploited.
Mulluscs			
GASTROPODS (general)	Most deposit their eggs in capsules which are fastened to the bottom. Few genera spawn their eggs in a gelatinous layer, attached to a substratum. Primitive gastropods spawn eggs freely into the water. Egg and brood protection as well as viviparous species occur.	The larvae, developed from gelatinous eggs or from capsules, usually remain on the bottom. More than half of the species have larvae with long pelagic life, species of short pelagic life are relatively rare. The gastropod larvae are eaten e.g. by herring, mackerels, etc.	Different species are adapted for different conditions of life. Most species live in bottom substrata or lie on it ; crawling gastropods also exist. Mostly detritus feeders.
Littorina littorea (periwinkle)	Deposited in capsules which usually are pelagic but may also be fastened to the bottom.	Pelagic feeding on plankton.	Lives on bottom in shallow water.
Littorina obtusata	Deposited in gelatinous mucus, fastened to stones or seaweeds.	Larvae develop to crawling stage with small shell within the gelatinous mucus, on bottom.	Crawls slowly on the bottom or lying on it.
Gibbula cineraria	Pelagic.	Pelagic.	Lives on hard bottom. Good fish food.
BIVALVES (mussels) (general)	Brood protection is common. On the bottom fastened eggs as well as pelagic eggs occur.	Mostly pelagic. The young of bivalves, unable to move in adult stage, are for a long time able to move in water mass or crawl on the bottom.	Majority occur in bottom substrata and fixed on it. Several crawling species exist. Many species important as fish food and as food for man (oysters, edible mussel, etc.). Detritus feeders.
Nucula nitida	Pelagic.	Pelagic.	Lives in soft bottom.
Mytilus edulis (edible mussel)	Pelagic.	Pelagic, feeding on plankton.	On hard bottom fastened to bottom substrata in shallow water to a depth of ca. 50 m., or lying loose on it.
Ostrea edulis (oyster)	Egg and brood protection (Embryos develop in mantel cavity to veliger stage).	Pelagic.	In shallow water and on tidal flats, fastened or on artificial support. Is cultivated. Filter feeder.
Cyprina islandica	Pelagic.	Pelagic, planktotrophic.	Buried in the fine sandy mud or sand. The siphon reaches the sediment surface. Important as fish food.
Teredo megotara (shipsworm)	Brood protection.	Pelagic.	Burrows into wood, often doing much damage to wooden ships, harbour constructions, etc.
CEPHALOPODS (Squids and octopi)	Eggs usually lying on bottom in long capsules.	Pelagic.	Most species pelagic ; some live on bottom substrata only ; large octopi live on and in bottom substrata and can also swim. Detritus feeders, and feeders on other benthonic animals.

TABLE 2 (*continued*)

Organism	*Eggs*	*Larvae and young*	*Adults*
Echinoderms (general)	Usually the eggs are pelagic, brood protection occurs, specially in colder areas; few species are viviparous.	Usually with long pelagic planktotropic life, but also pelagic lecithotrophic life occur.	Most species crawl on bottom feeding on other benthonic animals. Some live in the bottom substrata and some are fixed on it.
Asterias mülleri (starfish)	Brood protection.	The young leave the mother as fully developed young bottom stages.	Crawls on the bottom.
Solaster endeca	Pelagic, floating singly at the surface.	Pelagic.*	Crawls on the bottom.
Ophiura robusta (brittle-star)	Pelagic.	Pelagic feeding on plankton.	Lives mainly on bottom.
Tunicates	Mostly asexual reproduction. Eggs are pelagic but brood protection occurs in some species.	The larvae of sessile tunicates are mostly fixed to bottom substrata; larvae are pelagic for only a very short time.	Most species are pelagic, only Ascidians are fixed on hard bottom. Filter feeders.
Pisces (fish)			
Rays and Sharks	Eggs deposited in capsules on the bottom.	Larvae developed in capsules; young live on bottom.	Often on bottom substrata feeding on other benthos animals.
Herrings	Most species have pelagic eggs (e.g. pilchard, sprat, menhadden). By some species lying on bottom (Atlantic herring) or fastened to the vegetation (Pacific herring).	Pelagic, feeding on.	Pelagic.
Plaice	Pelagic.	Pelagic.	Spend most of their life on bottom, feeding mostly on benthonic animals.
Haddock	Pelagic.	Pelagic, young lie often on bottom, feeding on bottom animals.	Often on bottom, feeding partly on benthonic animals.

* See footnote p. 190.

It will be seen that the task of examining the association between organisms and the continental shelf is complicated by two principal considerations. Firstly, there is the difficulty of biologically designating precisely the limits of the shelf and the limits of the influence exerted by it. Especially is this so since, remembering that the organisms concerned live only in aquatic medium, the shelf cannot be considered only in terms of the solid materials of which it is constructed: the water overlying the shelf is as important as the shelf-material. Secondly, there is the complication of the differences of relations for different life-phases; this complication is the greater because of the diversity of organisms in this zone: most principal groups of animals, and many groups of plants, are represented in the shelf-communities.

The conventional approach to the analysis of the complex communities of the shelf is to consider the organisms which normally appear in these communities, chiefly in adult form, and to classify them according to habits and normal habitat. Several classifications have been made along these lines; table 3 sets out in the first column a classification drawn up in accordance with the more generally accepted views on this question. The second column describes the habits and habitats of different groups of adult organisms that enter or live in this zone. The organisms in the first three classes have living space dependence on the shelf, both materials and water, during their adult life; those of the fourth class have other kinds of dependence on the shelf during adult life, and these are chiefly with water overlying the shelf, but sometimes with shelf-material. The third column shows the habitat, habits, etc., of the eggs, larvae and young of certain organisms representative of each group where their young stages are associated with the shelf.

TABLE 3

Classification of organisms normally occurring as members of shelf communities in adult phase, with indication of habitat, etc., of juvenile phases

Classification	*Definitions, examples, habits and habitats*	*Larval life*
A) **In-biota** . . .	*Organisms which spend all their post-larval life within the material of the bottom, feeding and growing there.*	
(*a*) Meso-biota . . .	*Animals which are completely buried in the substratum itself; some in its interstitial spaces.* They may move within this medium by digging while feeding, for example, or move about within the interstices. Some examples of animals in this group are: certain annelid worms, such as *Polygordius* and *Protodrilus*; certain copepods (crustaceans), *Paramesochra, Evansula*; and certain bivalved molluscs and gastropods.	The majority of animals living in sand deposit their eggs in the sand and the larvae develop there or in the overlying water. Mesobiota living in mud usually have pelagic larvae, but viviparity and brood protection also occur.
(*b*) Endo-biota . . .	*Animals which live in cavities or holes and tubes which they construct in the bottom substratum.* It is possible for some of them to leave these holes or tubes if, for example, the immediate environment becomes unfavourable, or in order to spawn. Examples are: certain annolids, such as *Arenicola*; certain clams, such as *Mya*, and boring isopods, such as *Sphaeroma*. Others, such as the boring clams or *Pholadidea*, bore into rocks and become prisoners in their own cavities. There are also animals such as the sea cucumber, *Cucumaria pseudopopulifera*, which, because of growth after entrance, may become imprisoned in the old burrows of rock-boring clams.	Spawning often on the surface of sand and mud or in free waters. Eggs can also be deposited in the tubes in the mud (e.g. *Corophium arenarium*) or in capsules and in gelatinous masses on the surface or near the mouth of their tubes (e.g. some polychaetes). Pelagic larvae are most common for these animals. Asexual reproduction occurs.
B) **Epibiota**	*Organisms that in post-larval form are fixed to the bottom and feed, grow and reproduce there.*	
(*a*) Fixo-sessilo . . .	*Organisms which fasten themselves to the hard bottom substratum or to hard objects on it (such as stones, big shells etc.) during their entire adult life or during a great portion of it.* There are organisms that fasten themselves to the substratum by means of their outer skeleton or by secretions; the hydroids (Hydrozoa) fasten themselves by means of their chitinous periderm; gooseneck barnacles have a leathery stalk; the tunicates are fixed by their cellulose-like test; certain molluscs fasten themselves by means of calcareous shells; sea mussels (edible mussels), such as *Mytilus*, use a byssus (a bundle of threads secreted by the foot). The large brown algae (kelps) are held to the substratum by a root-like hold fast.	Asexual reproduction occurs in many species. The larval stage is usually neritic-pelagic. Feeding on plankton. Viviparity occurs in this group. Before settlement the young of many species can crawl along the bottom.
(*b*) Rhizo-sessilo . . .	*Organisms which are fastened to the soft bottom (sand or mud) by various means.* For example, a root-shaped plexus is formed by the crinoid, *Rhizocrinus*; alcynonarians, such as *Pennatularia*, have a basal stalk which is embedded in the sand or mud. Higher plants, such as *Zostera*, have rhizomes and roots for attachment.	The larval stage is usually neritic-pelagic, feeding on plankton. Asexual reproduction occurs in many species as well as viviparity. Many species have non-pelagic larvae.
C) **Suprabiota** . . .	*Organisms that lie on or more freely about on the bottom and feed, grow and reproduce there.*	
(*a*) Libero-sessilo . .	*Organisms that lie on the sea bed in the adult stage, but are not fixed to it, and are incapable of active travel.* Examples are: flat oysters and foraminifera.	Larval stage usually planktonic. Brood-protection also common. The non-pelagic larvae and young can crawl around on the bottom.
(*b*) Hemi-sessilo . . .	*Organisms which, although capable of moving on the substratum during their adult life, usually settle in one place and remain there for variable periods of time, or do not move very far away.* The animals are sessile during feeding, but move when disturbed. Change of location may be caused by environmental conditions adverse for certain purposes, e.g. breeding, etc. Some of these organisms (as certain annelids) may encase themselves in fixed tubes. Some are held against the substratum by spinous projections. Chitons, limpets and other molluscs crawl slowly over very small distances only — although some may be almost sessile on a so-called foot.	Most eggs and larvae are pelagic. Eggs can be shed singly and adhering separately to substrata. Brood protection occur. Planktonic, lecithotrophic larvae are rather common in this group.
(*c*) Reptovagilo . . .	*Organisms which during their adult stages are capable of movement, but only on the sea bed.* This group of orgamisms includes forms such as starfish and some large crustacea (e.g. large crabs) and octopi which range more widely than do the forms described above and which do not hold themselves in one place for long periods of time.	Brood protection common, but majority have pelagic eggs and larvae. The larvae feed usually on phytoplankton, but in some groups also on zooplankton (e.g. decaped larvae).

TABLE 3 (*continued*)

Classification	*Definitions, examples, habits and habitats*	*Larval life*
(*d*) Bivagile	*Organisms which can crawl on the bottom and also move freely through the waters.* As examples are: *Cumacea*, some shrimp species, *Mesidotea entomon*, *Gammarus locusta*, etc. To this group belong also haptic animals which are vagile on the bottom while searching for food, but attach themselves when disturbed (e.g. tardigrade *Batillipes*, annelid *Diuredrilus*).	Mostly pelagic eggs and pelagic planktotrophic larvae.
D) **Swimming organisms**	*Organisms that swim freely in the shelf water, some of which remain in the shelf water all their post-larval life whilst others visit these waters for only part of the post-larval life; of the former, some spend most of the time on or near the bottom or even in it whilst others live in middle and/or surface waters; of the latter, some visit for reproductive purposes, others for feeding, some for both these purposes, and others merely cross these waters.*	
I. PERMANENT AND SEMIPERMANENT		
1. *Demersal fish* . .	*Fish which spend most of their post-larval life over the shelf and close to the bottom or on the bottom substrata and feed mainly on the benthonic organisms.* This group can be divided into three sub-groups:	
(*a*) *Flatfish*	*Fish which have very flattened bodies, and spend much of their time on the sea floor.* The main food is taken from the bottom. Generally, but not always, the range of migration of these fishes is smaller than of the following sub-groups. Examples are the plaice, soles, halibuts, turbots, flounders, etc.	Mostly pelagic egg and larvae. The floating eggs are found in different layers of water.
(*b*) *Gadids*	*Cod-like fishes closely related to the sea bed, but which move from deep to middle or shallow waters usually for feeding and breeding purposes.* Some species migrate long distances over deep oceanic areas (e.g. cod). Part of the food is taken from the bottom and part from the water mass. Examples of this sub-group are: cods, haddock, whitings, pollacks, etc.	Mostly pelagic egg and larvae. E.g. the egg of the hake floats freely to the surface from deep or shallow waters, where they are laid. They drift on the surface, where they hatch. Few dermesal larvae also occur (e.g. haddock).
(*c*) Percomorphs . . .	*Perch-like fishes which live preferably in rocky or coral bottom or wherever they may find shelter and food near the sea bed.* (E.g. perches, croakers, breams, basses.)	
2. *Pelagic fish* . . .	*Fishes which spend most of their life in the upper layers of the water and feed mainly on plankton or other pelagic fish.* Here two sub-divisions can be made:	
(*a*) Clupeoias (and ecologically related species)	Herring-like fishes which live comparatively near to the shore, dwelling either at or near the surface are: herrings, sardines, sprats, anchovies, menhaden, etc. They make extensive wanderings comparatively close to the coasts, appearing at certain times and places for the purposes of feeding and spawning.	Eggs lying on the bottom or fastened to it or are pelagic. E.g. the Pacific herring which lays adhesive eggs in coastal waters, attached to vegetation or which deposits them on the sea floor (Atlantic herrings). Sardines' eggs drift in the upper layers of the water. Mostly pelagic egg and larvae.
(*b*) Others	Other examples of fishes which live in bays, inlets, channels and offshore at or near the surface are: jacks, pompanos, amberjacks, etc. Oceanic pelagic fish (e.g. tunas, mackerels, sharks) may in most places live in the waters above the continental shelf where there in higher concentration of food available.	
II. VISITORS		
1. To reproduce . . .	*Fish and mammals which migrate to coastal areas for spawning.* E.g. Pacific herring which fastens its eggs to the vegetation near coast and in estuaries, channels (milkfish), which spawns in coastal areas. Mullets spend most of their life in coastal lakes, rivers and bays, spending only short periods in marine waters, spawning probably occurring in sea water, near the coast. Coastal breeders of aquatic mammals which give the birth to the young on coast or on ice, belong to this group. They migrate long distances and feed mainly on fish (e.g. seals).	

TABLE 3 (*continued*)

Classification	*Definitions, examples, habits and habitats*	*Larval life*
2. To feed	Most demersal fish and majority of pelagic species feed on continental shelf, either on the benthonic animals (demersal fish) or on the rich plankton crop (pelagic fish).	Most pelagic larvae feed on the plankton in the waters above continental shelf, which is generally more productive than offshore areas.
3. In transit	*Fishes which move from the sea to the fresh water, or from fresh water to the sea for spawning purposes.* (E.g. salmon, anadromous fish and eel, *Anguilla*, catadromous fish). Shads and smelt are other examples. Lagoon and brackish water fish can also be considered as a sub-group of migratory fish. This group of fish live near the bottom in coastal waters and brackish water bays in river mouths, but migrate for certain periods into sea water.	Salmon spawn in fresh water (most species in rivers). The young develop also in fresh water. Eels cover vast oceanic areas during their spawning migrations, and spawning takes place on definite grounds in the ocean at mid water.

List of Special Terms

Abyssal (adj.)	Of the deep sea (usually below 1,000 m. depth).
Amphipod (n.)	A group of crustaceans.
Anadromous fish	Fish which spend most of their adult life in salt water, but periodically migrate into fresh water for spawning purposes.
Asexual (adj.)	Sexless ; without involving sexual differentiation.
Benthonic (= benthic) (adj.)	Pertaining to benthos.
Benthos (n.)	Aquatic animals and plants spending most or all of their life on or in the bottom.
Biota (n.)	Plants and animals, generally referred to a region or a special environment.
Bivagile (adj.)	Of organisms which can crawl on the bottom and also move through the free water.
Bivalves (n.)	Two-valved aquatic animals, such as clams, mussels.
Brood protection	Protection of eggs after being shed from the ovary until hatching, or until the young are able to move and feed.
Byssus (n.)	A bundle of threads by which certain mussels adhere to rocks or other substrate.
Catadromous fish	Fish which spend most of their adult life in fresh water, but migrate into the sea (salt water) for spawning.
Chitin (n.)	A horny substance, forming the harder part of the outer integument of insects, crustaceans, etc.
Clupeoids (n.)	Herring-like fishes ; (adj. — clupeoid).
Coelom (n.)	The body cavity.
Community (= association) (n.)	A group of species living under the particular conditions offered by a particular situation (in a biotope).
Copepod (n.)	A minute crustacean, belonging to the family Copepoda.
Demersal animals, (fish, etc.)	Animals which spend most of their life close to or on the bottom.
Detritus (n.)	Non-living particulate matter in the water.
Echinoderm (n.)	A member of the phylum Echinodermata, marine organisms including starfishes, sea urchins and their allies.
Endo-biota (n.)	Organisms, which live in cavities, or holes and tubes which they construct, in the bottom.
Epi-biota (n.)	Organisms which occur entirely above the bottom surface, but are fixed to it or have some special anchoring organ sunk in the bottom.
Fixo-sessile (adj.)	Of organisms that fasten themselves to the hard bottom or on hard objects on it, during their entire adult life or the greater part of it.
Gastropod (n.)	A member of large class of molluscs, which includes most forms that have a univalve shell.
Habitat (n.)	The site in which an organism normally lives ; refers also to the environment to be found at that site.

Haptic Hemi-sessile (adj.)	Of organisms which, although capable of moving on the bottom during their adult life, usually settle in one place and remain there for extended periods and do not move far away.
In-biota (n.)	Organisms which spend most of their post-larval life within the sea bottom material.
Intertidal zone	The area between high and low water.
Larviparous (adj.)	Of organisms in which embryonic development proceeds to larval stage within the body, the young being produced as larvae which continue development outside the body of the parent.
Libero-sessile (adj.)	Of organisms which lie on the sea bed in the adult stage, but not fixed to it, although incapable of active travel.
Lurker (n.)	An animal whose feeding habit is to lie in wait for prey.
Meso-biota (n.)	Organisms completely buried in the bottom itself or living in its interstitial space.
Nekton (n.)	The free-living actively swimming organisms (e.g. fish).
Neritic (adj.)	Of or pertaining to the coastal and shallow waters of the aquatic environment above the continental shelf.
Pelagic (adj.)	Of or pertaining to surface waters ; e.g. pelagic fish — fish which spend most of their life in the upper layers of the water.
Periderm (n.)	The cortical tissue derived from the phellogen growth.
Phytoplankton (n.)	See plankton.
Plankton (n.)	Small organisms suspended in the water mass without or with only very limited mobility : phytoplankton — plant plankton. zooplankton — animal plankton.
Planktonic (adj.)	Of or pertaining to plankton.
Planktotrophic (adj.)	Of organisms feeding on plankton.
Polychaet (n.)	An organism belonging to the order of annelide worms, Polychaeta.
Repto-vagile (adj.)	Of organisms which during their adult stage are capable of movement only on the sea bed.
Rhizo-sessile (adj.)	Of organisms which are held to the soft bottom (mud or sand) by various means.
Sedentary (adj.)	Of bottom living organisms which, although not fixed to the bottom, move little if at all.
Sessile (adj.)	Attached and not free to move about.
Supra-biota (n.)	Organisms which lie on or move freely about on the bottom substratum.
Suspended matter	Particulate matter in the water.
Turbulence (n.)	Irregular nonlinear movement of water particles in a water mass.
Vagile (adj.)	Wandering, mobile.
Viviparous (adj.)	Of organisms in which development in the parent body continues to assumption of adult form.
Zooplankton (n.)	See plankton.

NEGOTIATING TEXTS LEADING TO ARTICLES 15, 74 AND 83 OF THE THIRD UNITED NATIONS CONVENTION ON THE LAW OF THE SEA

INFORMAL SINGLE NEGOTIATING TEXT
A/CONF.62/WP.8/PART II (ISNT, 1975)

Article 15 (Article 13 in this version)

1. Where the coasts of two 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. The provisions of this paragraph shall not apply, however, where it is necessary by reason of historic title or other special circumstances to delimit the territorial seas of the two States in a way which is at variance with this provision.

2. The line of delimitation between the territorial seas of two States lying opposite to each other or adjacent to each other shall be marked on large-scale charts officially recognized by the coastal States.

Article 74 (Article 61 in this version)

1. The delimitation of the exclusive economic zone between adjacent or opposite States shall be effected by agreement in accordance with equitable principles, employing, where appropriate, the median or equidistance line, and taking account of all the relevant circumstances.

2. If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in part . . . (Settlement of disputes).

3. Pending agreement, no State is entitled to extend its exclusive economic zone beyond the median line or the equidistance line.

4. For the purposes of this article, "median line" means the line every point of which is equidistant from the nearest points of the baselines from which the breadth of the territorial sea of each State is measured.

5. In delimiting the boundaries of the exclusive economic zone, any lines which are drawn in accordance with the provisions of this article should be defined with reference to charts and geographical features as they exist at a particular date, and reference should be made to fixed permanent identifiable points on the land.

6. Where there is an agreement in force between the States concerned, questions relating to the delimitation of the exclusive economic zone shall be determined in accordance with the provisions of that agreement.

Article 83 (Article 70 in this version)

1. The delimitation of the continental shelf between adjacent or opposite States shall be affected [sic] by agreement in accordance with equitable principles, employing, where appropriate, the median or equidistance line, and taking account of all the relevant circumstances.

2. If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in part . . . (Settlement of disputes).

3. Pending agreement, no State is entitled to extend its continental shelf beyond the median line or the equidistance line.

4. For the purposes of this article, "median line" means the line every point of which is equidistant from the nearest points of the baselines from which the breadth of the territorial sea of each States is measured.

5. In delimiting the boundaries of the continental shelf, any lines which are drawn in accordance with the provisions of this article should be defined with reference to charts and geographical features as they exist at a particular date, and reference should be made to fixed permanent identifiable points on the land.

6. Where there is an agreement in force between the States concerned, questions relating to the delimitation of the continental shelf shall be determined in accordance with the provisions of that agreement.

REVISED SINGLE NEGOTIATING TEXT
A/CONF.62/WP.8/REV.1/PART II (RSNT, 1976)

Article 15 (Article 14 in this version)

Delimitation of the territorial sea between States with opposite or adjacent coasts

Where the coasts of two 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. This article does not apply, however, where it is necessary by reason of historic title or other special circumstances to delimit the territorial seas of the two States in a way which is at variance with this provision.

Article 74 (Article 62 in this version)

Delimitation of the exclusive economic zone between adjacent or opposite States

1. The delimitation of the exclusive economic zone between adjacent or opposite States shall be effected by agreement in accordance with equitable principles, employing, where appropriate, the median or equidistant line, and taking account of all the relevant circumstances.

2. If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in Part . . . (Settlement of disputes).

3. Pending agreement or settlement, the States concerned shall make provisional arrangements, taking into account the provisions of paragraph 1.

4. For the purposes of the present Convention, "median or equidistant line" means the line every point of which is equidistant from the nearest points of the baselines from which the breadth of the territorial sea of each State is measured.

5. Where there is an agreement in force between the States concerned, questions relating to the delimitation of the exclusive economic zone shall be determined in accordance with the provisions of that agreement.

Article 83 (Article 71 in this version)

Delimitation of the continental shelf between adjacent or opposite States

1. The delimitation of the continental shelf between adjacent or opposite States shall be effected by agreement in accordance with equitable principles, employing, where appropriate, the median or equidistant line, and taking account of all the relevant circumstances.

2. If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in Part . . . (Settlement of disputes).

3. Pending agreement or settlement, the States concerned shall make provisional arrangements, taking into account the provisions of paragraph 1.

4. Where there is an agreement in force between the States concerned, questions relating to the delimitation of the continental shelf shall be determined in accordance with the provisions of that agreement.

INFORMAL COMPOSITE NEGOTIATING TEXT
A/CONF.62/WP.10 (ICNT, 1977)

Article 15

Delimitation of the territorial sea between States with opposite or adjacent coasts

Where the coasts of two 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. This article does not apply, however, where it is necessary by reason of historic title or other special circumstances to delimit the territorial seas of the two States in a way which is at variance with this provision.

Article 74

Delimitation of the exclusive economic zone between adjacent or opposite States

1. The delimitation of the exclusive economic zone between adjacent or opposite States shall be effected by agreement in accordance with equitable principles, employing, where appropriate, the median or equidistance line, and taking account of all the relevant circumstances.

2. If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in Part XV of the present Convention.

3. Pending agreement or settlement, the States concerned shall make provisional arrangements, taking into account the provisions of paragraph 1.

4. For the purposes of the present Convention, "median or equidistance line" means the line every point of which is equidistant from the nearest points of the baselines from which the breadth of the territorial sea of each State is measured.

5. Where there is an agreement in force between the States concerned, questions relating to the delimitation of the exclusive economic zone shall be determined in accordance with the provisions of that agreement.

Article 83

Delimitation of the continental shelf between adjacent or opposite States

1. The delimitation of the continental shelf between adjacent or opposite States shall be effected by agreement in accordance with equitable principles, employing, where appropriate, the median or equidistance line, and taking account of all the relevant circumstances.

2. If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in Part XV of the present Convention.

3. Pending agreement or settlement, the States concerned shall make provisional arrangements, taking into account the provisions of paragraph 1.

4. Where there is an agreement in force between the States concerned, questions relating to the delimitation of the continental shelf shall be determined in accordance with the provisions of that agreement.

INFORMAL COMPOSITE NEGOTIATING TEXT, REVISION 1
A/CONF.62/WP.10/REV.1 (ICNT/REV.1, 1979)

Article 15

Delimitation of the territorial sea between States with opposite or adjacent coasts

Where the coasts of two 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. The above provision does not apply, however, where it is necessary by reason of historic title or other special circumstances to delimit the territorial seas of the two States in a way which is at variance therewith.

Article 74

Delimitation of the exclusive economic zone between adjacent or opposite States

1. The delimitation of the exclusive economic zone between adjacent or opposite States shall be effected by agreement in accordance with equitable principles, employing, where appropriate, the median or equidistance line, and taking into account of all the relevant circumstances.

2. If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in Part XV.

3. Pending agreement or settlement, the States concerned shall make provisional arrangements, taking into account the provisions of paragraph 1.

4. For the purposes of this Convention, "median or equidistance line" means the line every point of which is equdistant [sic] from the nearest points of the baselines from which the breadth of the territorial sea of each State is measured.

5. Where there is an agreement in force between the States concerned, questions relating to the delimitation of the exclusive economic zone shall be determined in accordance with the provisions of that agreement.

Article 83

Delimitation of the continental shelf between adjacent or opposite States

1. The delimitation of the continental shelf between adjacent or opposite States shall be effected by agreement in accordance with equitable principles, employing, where appropriate, the median or equidistance line, and taking account of all the relevant circumstances.

2. If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in Part XV.

3. Pending agreement or settlement, the States concerned shall make provisional arrangements, taking into account the provisions of paragraph 1.

4. Where there is an agreement in force between the States concerned, questions relating to the delimitation of the continental shelf shall be determined in accordance with the provisions of that agreement.

INFORMAL COMPOSITE NEGOTIATING TEXT, REVISION 2
A/CONF.62/WP.10/REV.2 (ICNT/REV.2, 1980)

Article 15

Delimitation of the territorial sea between States with opposite or adjacent coasts

Where the coasts of two 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. The above provision does not apply, however, where it is necessary by reason of historic title or other special circumstances to delimit the territorial seas of the two States in a way which is at variance therewith.

Article 74

Delimitation of the exclusive economic zone between States with opposite or adjacent coasts

1. The delimitation of the exclusive economic zone between States with opposite or adjacent coasts shall be effected by agreement in conformity with international law. Such an agreement shall be in accordance with equitable principles, employing the median or equidistance line, where appropriate, and taking account of all circumstances prevailing in the area concerned.

2. If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in Part XV.

3. Pending agreement as provided for in paragraph 1, the States concerned, in a spirit of understanding and co-operation, shall make every effort to enter into provisional arrangements of a practical nature and, during this transitional period, not to jeopardize or hamper the reaching of the final agreement. Such arrangements shall be without prejudice to the final delimitation.

4. Where there is an agreement in force between the States concerned, questions relating to the delimitation of the exclusive economic zone shall be determined in accordance with the provisions of that agreement.

Article 83

Delimitation of the continental shelf between States with opposite or adjacent coasts

1. The delimitation of the continental shelf between States with opposite or adjacent coasts shall be effected by agreement in conformity with international law. Such an agreement shall be in accordance with equitable principles, employing the median or equidistance line, where appropriate, and taking account of all circumstances prevailing in the area concerned.

2. If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in Part XV.

3. Pending agreement as provided for in paragraph 1, the States concerned, in a spirit of understanding and co-operation, shall make every effort to enter into provisional arrangements of a practical nature and, during this transitional period, not to jeopardize or hamper the reaching of the final agreement. Such arrangements shall be without prejudice to the final delimitation.

4. Where there is an agreement in force between the States concerned, questions relating to the delimitation of the continental shelf shall be determined in accordance with the provisions of that agreement.

INFORMAL COMPOSITE NEGOTIATING TEXT, REVISION 3
A/CONF.62/WP.10/REV.3 (ICNT/REV.3, 1980)

Article 15

Delimitation of the territorial sea between States with opposite or adjacent coasts

Where the coasts of two 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. The above provision does not apply, however, where it is necessary by reason of historic title or other special circumstances to delimit the territorial seas of the two States in a way which is at variance therewith.

Article 74

Delimitation of the exclusive economic zone between States with opposite or adjacent coasts

1. The delimitation of the exclusive economic zone between States with opposite or adjacent coasts shall be effected by agreement in conformity with international law. Such an agreement shall be in accordance with equitable principles, employing the median or equidistance line, where appropriate, and taking account of all circumstances prevailing in the area concerned.

2. If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in Part XV.

3. Pending agreement as provided for in paragraph 1, the States concerned, in a spirit of understanding and co-operation, shall make every effort to enter into provisional arrangements of a practical nature and, during this transitional period, not to jeopardize or hamper the reaching of the final agreement. Such arrangements shall be without prejudice to the final delimitation.

4. Where there is an agreement in force between the States concerned, questions relating to the delimitation of the exclusive economic zone shall be determined in accordance with the provisions of that agreement.

Article 83

Delimitation of the continental shelf between States with opposite or adjacent coasts

1. The delimitation of the continental shelf between States with opposite or adjacent coasts shall be effected by agreement in conformity with international law. Such an agreement shall be in accordance with equitable principles, employing the median or equidistance line, where appropriate, and taking account of all circumstances prevailing in the area concerned.

2. If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in Part XV.

3. Pending agreement as provided for in paragraph 1, the States concerned, in a spirit of understanding and co-operation, shall make every effort to enter into provisional arrangements of a practical nature and, during this transitional period, not to jeopardize or hamper the reaching of the final agreement. Such arrangements shall be without prejudice to the final delimitation.

4. Where there is an agreement in force between the States concerned, questions relating to the delimitation of the continental shelf shall be determined in accordance with the provisions of that agreement.

DRAFT CONVENTION
A/CONF.62/L.78 (DRAFT CONVENTION 1981) (FINAL TEXT)

Article 15

Delimitation of the territorial sea between States with opposite or adjacent coasts

Where the coasts of two 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. The above provision does not apply, however, where it is necessary by reason of historic title or other special circumstances to delimit the territorial seas of the two States in a way which is at variance therewith.

Article 74

Delimitation of the exclusive economic zone between States with opposite or adjacent coasts

1. The delimitation of the exclusive economic zone between States with opposite or adjacent coasts shall be effected by agreement on the basis of international law, as referred to in Article 38 of the Statute of the International Court of Justice, in order to achieve an equitable solution.

2. If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in Part XV.

3. Pending agreement as provided for in paragraph 1, the States concerned, in a spirit of understanding and co-operation, shall make every effort to enter into provisional arrangements of a practical nature and, during this transitional period, not to jeopardize or hamper the reaching of the final agreement. Such arrangements shall be without prejudice to the final delimitation.

4. Where there is an agreement in force between the States concerned, questions relating to the delimitation of the exclusive economic zone shall be determined in accordance with the provisions of that agreement.

Article 83

Delimitation of the continental shelf between States with opposite or adjacent coasts

1. The delimitation of the continental shelf between States with opposite or adjacent coasts shall be effected by agreement on the basis of international law, as referred to in Article 38 of the Statute of the International Court of Justice, in order to achieve an equitable solution.

2. If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in Part XV.

3. Pending agreement as provided for in paragraph 1, the States concerned, in a spirit of understanding and co-operation, shall make every effort to enter into provisional arrangements of a practical nature and, during this transitional period, not to jeopardize or hamper the reaching of the final agreement. Such arrangements shall be without prejudice to the final delimitation.

4. Where there is an agreement in force between the States concerned, questions relating to the delimitation of the continental shelf shall be determined in accordance with the provisions of that agreement.

The Law of the Sea

Baselines:
An Examination of the Relevant Provisions of the United Nations Convention on the Law of the Sea

Office for Ocean Affairs and the Law of the Sea
United Nations · New York, 1989

Chapter I

NORMAL BASELINES

1. Article 5 of the 1982 United Nations Convention on the Law of the Sea (hereinafter referred to as the Convention) defines normal baselines, and articles 6 and 13 deal with particular cases of normal baselines when associated with islands situated on atolls or islands having fringing reefs and with low-tide elevations.

A. NORMAL BASELINES

Article 5
NORMAL BASELINE

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 the coastal State.

Officially recognized charts

2. Throughout the Convention the term "chart" means a nautical chart intended for use by mariners as an aid to navigation. Only nautical charts show all the relevant features such as low-water lines, low-tide elevations, drying reefs, etc.

3. All the coasts of the world are charted, although not always on a large scale or to great accuracy. In the case of those countries that publish charts of their own coasts, it may be assumed that it is their own charts that are officially recognized. In the case of countries that do not publish charts of their own coasts they should adopt the charts of whichever country has taken on the task of surveying their coasts.[1] It is the charts of this "primary charting authority" from which any other charts of the area will be derived. It will generally be desirable for a country which does not publish its own charts to indicate which charts it officially recognizes.

4. Undoubtedly, it is desirable to use existing charts wherever possible; however, a problem may arise in cases where there are no suitable charts because either the existing charts are too old and no longer sufficiently accurate (in particular the relative positioning of islands or other features may be significantly in error) or they are of too small a scale. In practice this is less likely to be a significant problem in the case of

the normal baseline than in the case of straight or archipelagic baselines (see articles 16 and 47, paragraph 9), but it may also arise if a boundary is to be negotiated, or if there is an agreement on access to resources within the State's zones of jurisdiction.

5. If the problem does arise, the ideal solution would be to have the coasts resurveyed and charted. At best that is a long-term solution, although in some cases small local check surveys may suffice. It may be expedient, therefore, to prepare and print special baseline charts compiled on a suitable scale on the basis of existing official land (topographical) maps, which are likely to be relatively up to date. It would be necessary for such specially prepared charts to show the low- and high-water lines and all low-tide elevations (whether they are to be used for baselines or not), together with such names and features as will assist the user (particularly in relating the baseline chart to the published navigational charts).

6. In general, where the shore has shelves, even the existing charts are likely to show the low-water line in relation to the adjacent coastline in greater detail or more correctly than the land map (which may use a different vertical datum level), while not perhaps showing the coastline as a whole correctly in relation to other features. In that case the low-water line should be transferred from the chart by reference to immediately adjacent features shown on both the map and the chart. Similarly, any low-tide elevations that are not shown on the map should be transferred from the chart. Appropriate graduation and lines of latitude and longitude would be required.

7. If a coastal State does not publish its own charts, mariners sailing its waters must rely on charts produced by some other country—generally one of the "world charting nations". It follows that if special baseline charts are made by the coastal State they are not likely to be used directly by mariners of other countries. Furthermore, unless they include accurate details of depths, navigational aids, essential topography and so on, they will be quite unsuitable for navigation. The purpose of the special charts will be, therefore, to make available all the necessary information so that other Governments are aware of what the baselines are, and so that charting authorities of other nations may if they wish promulgate the necessary information on their own charts, or in *Sailing Directions* or *Notices to Mariners*. It is recommended that the charts be marked "Not to be used for navigation".

8. The scale to be chosen for such special baseline charts will depend on the scales of the land maps available and the complexity of the low-water line. It is recommended that in general the scale should be within the range 1:50,000 to 1:200,000. A decision should be made on the number of charts needed to accommodate area and the scale of such charts. The smaller the number of charts needed to depict the baseline adequately the better. The charts must be given adequate publicity and copies must be deposited with the Secretary-General of the United Nations (article 16).

Low-water line

9. The low-water line is the intersection of the plane of low water with the shore. The low-water mark on a chart is the line depicting the level of chart datum. A technical resolution of the International Hydrographic Organization states that the level used as the chart datum shall be a plane so low that the tide will not frequently fall below it.[2] In practice this will be close to the lowest tidal level.

10. While States may choose an appropriate low-water line as listed in annex I, they will usually select the low-water line shown on existing charts. There are two reasons for this. First, except on coasts with a large tidal range of more than six metres and a foreshore which slopes very gently seawards, there will be little difference in the location of these various lines, although it may make a difference to whether or not some detached shoal areas become low-tide elevations (see article 13). In most cases, however, these differences will not greatly alter the location of either a 12-nautical-mile territorial sea or a 200-nautical-mile exclusive economic zone. Secondly, the cost of surveying offshore areas for a new chart datum and preparing and publishing new charts would be considerable. It would be hard to justify this additional expense if existing charts were satisfactory for navigation unless those charts were based on an inappropriate datum and showed low-water lines which were several hundred metres landwards of more suitable levels. That situation might apply along coasts with gently sloping shelves and having large tidal ranges.

11. It should be noted that on charts of small or intermediate scales the low-water line is not always discernible as a separate line distinct from the high-water line. In some cases either the scale of the chart or a small tidal range will make it impossible to separate the high- and low-water lines. In cases where there is a small tidal range, the high- and low-water lines may be virtually the same. In other cases the scale of the chart may be too small to allow the two levels to be differentiated, particularly on shores having steeply sloping shelves. For example, the extract from Australian chart 826 shows that in the south of Upstart Bay the low-water line is approximately one nautical mile seawards of the high-water mark, while on the bay's east coast only a high-water line is shown (figure 1).

12. The low-water line along the coast is a fact irrespective of its representation on charts. The territorial sea exists even if no particular low-water line has been selected or if no charts have been officially recognized. For enforcement of regulations, however, it is necessary to identify the location of the outer limit of the territorial sea, for which charts marking the low-water line are required.

13. Although the matter was broached at the 1930 Hague Conference, neither the 1958 Geneva Convention on the Territorial Sea and the Contiguous Zone (hereafter, 1958 Geneva Convention) nor the 1982 United Nations Convention considered the question of the baseline along an ice-covered coast. There are certainly areas where the natural low-water line of the land is permanently covered by ice and its location

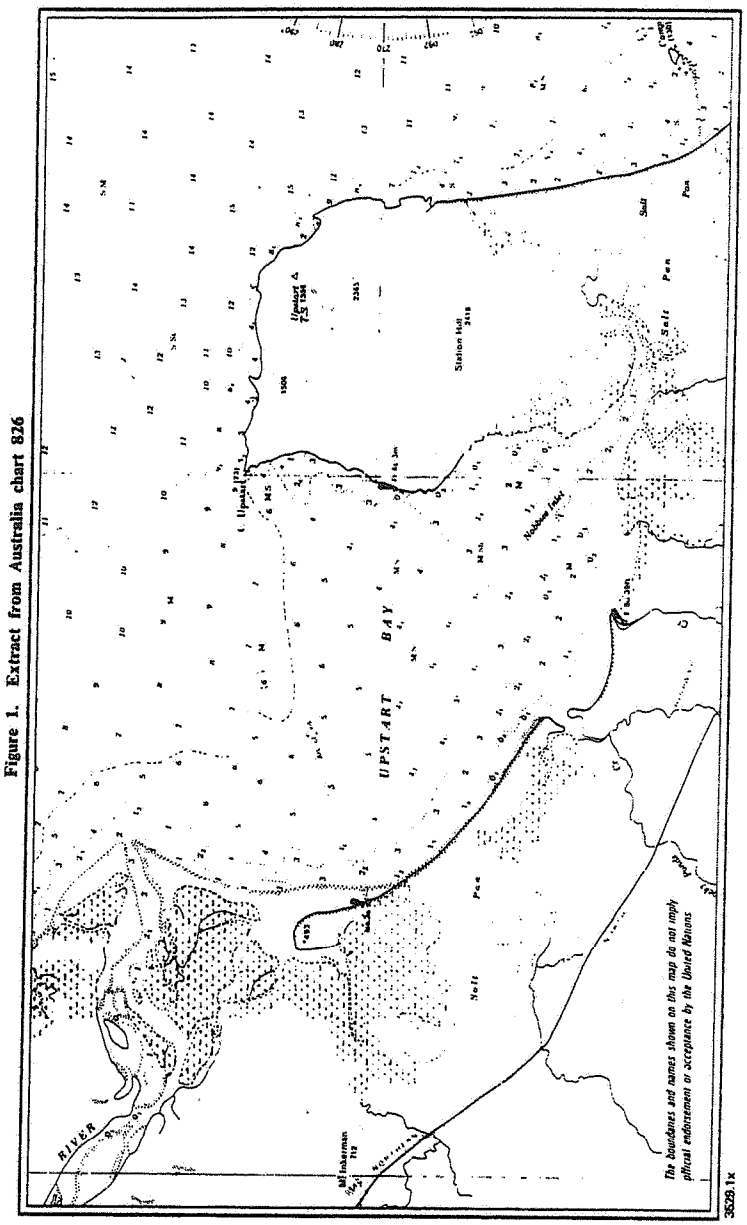


Figure 1. Extract from Australia chart 826

With permission from the Hydrographic Service, Royal Australian Navy.

cannot be determined. It has been suggested that in such cases the ice-foot of the glacier or ice-cap should be substituted for the low-water line. Since the ice-foot is constantly changing, it has also been suggested that the location should be determined from the most recent (probably aerial) survey, or should be a mean position determined over a period of time.

Scale

14. The scale of a chart is an expression of the relationship between a distance measured on the earth's surface and the length that represents it on the chart. Thus a scale of 1:50,000 means that one unit on the map represents 50,000 units on the ground. That means that a chart with a scale of 1:50,000 is of a larger scale than a chart of scale 1:100,000. The larger-scale charts allow more detail to be shown and are usually kept more up to date for minor changes than the smaller-scale charts.

15. Article 5 of the Convention refers to "large-scale charts". In general, it is sufficient to refer to the appropriate published charts in order to obtain details of the "normal baseline". The larger the scale of the chart selected, the more accurate will be the depiction of the baseline. Because of the wide variety of scales employed for depicting coastal areas, depending on navigational needs and the detail with which an area has been surveyed, it is not possible to state what may be the smallest scale used to show the "normal baseline", and it may not be convenient or necessary to refer to the largest scale available. Where circumstances permit, the range may lie between 1:50,000 and 1:200,000.

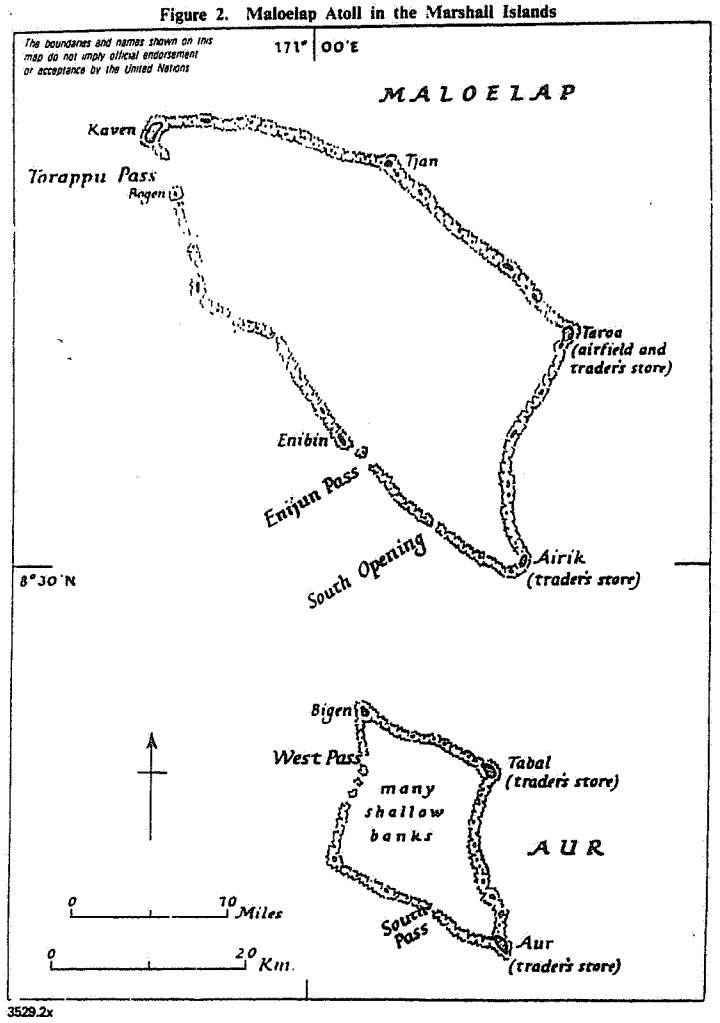
B. Reefs

Article 6
REEFS

In the case of islands situated on atolls or of islands having fringing reefs, the baseline for measuring the breadth of the territorial sea is the seaward low-water line of the reef, as shown by the appropriate symbol on charts officially recognized by the coastal State.

16. The two terms which must be considered in article 6 are "islands situated on atolls" and "islands having fringing reefs". Geomorphologists reserve the term atoll for reefs which surround a lagoon and are surmounted by one or more islands. The reefs are usually interrupted by channels, generally on the lee side of the atoll, and the water in the lagoon has an average depth of 45 metres.[3] Maloelap in the Marshall Islands provides a classical example of an atoll in the strict geomorphological sense (figure 2). Geomorphologists further subdivide atolls according to their location. Oceanic atolls have localized foundations, usually of volcanic origin, at depths of at least 550 metres. These are most common in the western Pacific Ocean. Shelf atolls are found on the continental shelf and usually have foundations shallower than 550 metres. Seringpa-

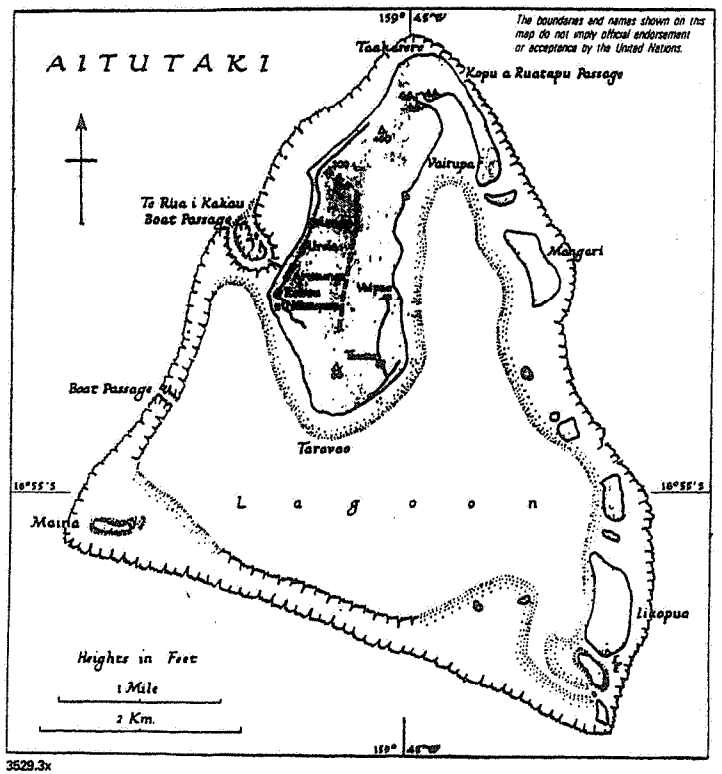
Figure 2. Maloelap Atoll in the Marshall Islands



Source: Pacific Islands, vol. IV, Western Pacific, Geographical Handbook Series, British Crown Copyright. Reproduced by permission of the Controller of Her Britannic Majesty's Stationery Office.

tam and Scott Reef located off the north-west coast of Australia are typical of such atolls. Finally, compound atolls consist of recent structures surrounding the remains of former atolls. The Houtman Abrolhos Islands off the west coast of Australia are compound atolls.

Figure 3. Aitutaki in the Cook Islands

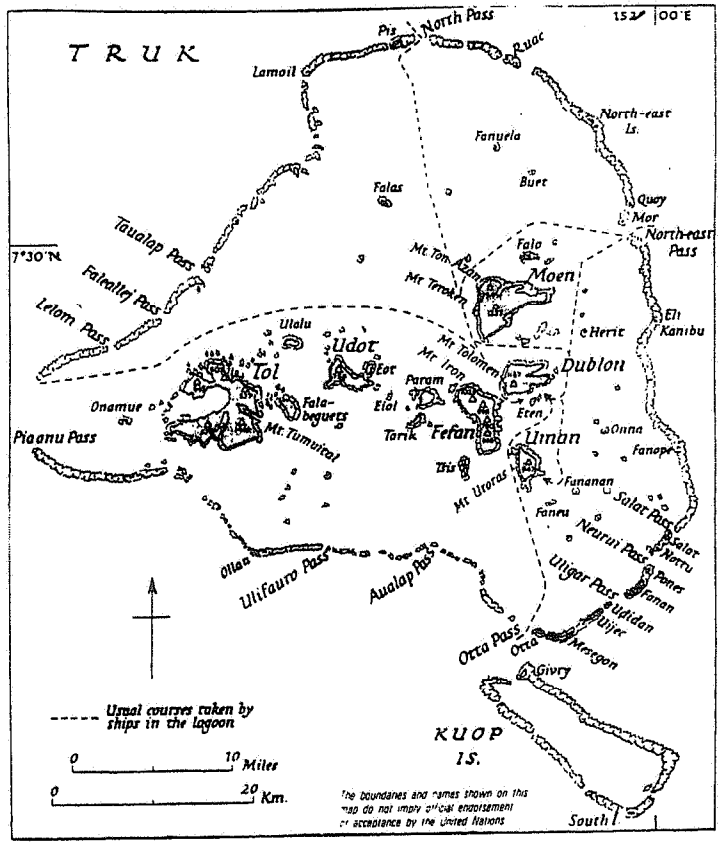


Source: Pacific Islands, vol. II, Eastern Pacific, Geographical Handbook Series, British Crown Copyright. Reproduced by permission of the Controller of Her Britannic Majesty's Stationery Office.

17. Article 6, however, is not confined to atolls in the strict scientific sense. There are features that correspond to more general definitions of an atoll, for instance, a ring-shaped reef with or without an island situated on it surrounded by the open sea, that encloses a lagoon. It should be noted, however, that article 6 applies to atolls only if islands are situated on them. Some of these features are described below.

18. Structures called "almost-atolls" consist of a small subsiding island which is surrounded by a circular reef; between these two features is a lagoon. Aitutaki in the Cook Islands (figure 3) and Truk in the Caroline Islands (figure 4) represent "almost-atolls". Aitutaki is a subsiding volcanic formation which has been structurally tilted so that it

Figure 4. Truk in the Caroline Islands



3529.4x

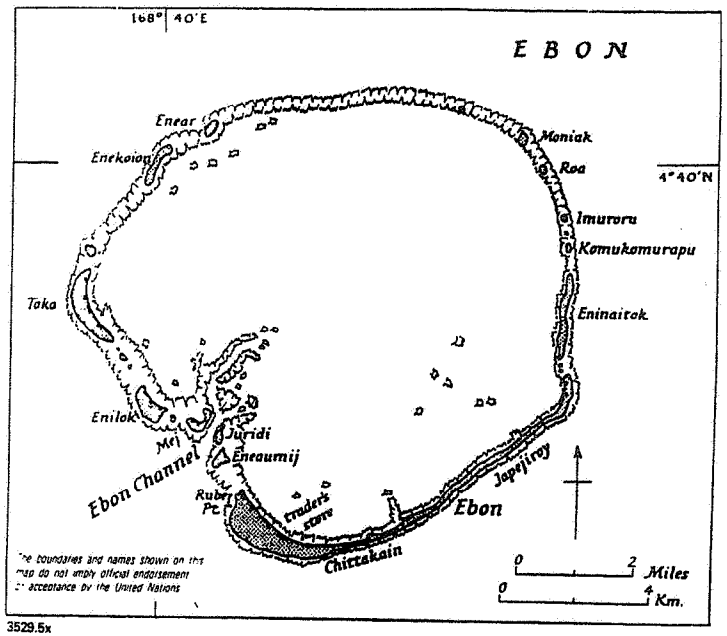
Source: Pacific Islands, vol. IV, Western Pacific, Geographical Handbook Series, British Crown Copyright. Reproduced by permission of the Controller of Her Britannic Majesty's Stationery Office.

merges with the surrounding reef on the north. Truk consists of the multiple peaks of a large submerging volcanic mountain.

19. Horseshoe reefs can become closed and resemble atolls. Such features tend to form in areas where there is an almost constant wave pattern. The limbs of the horseshoe are formed on the leeward side of the reef and may converge and join.

20. The name "faro" is given to a small atoll-shaped or oblong reef with a lagoon up to 30 metres deep, forming part of the rim of a barrier reef or of an atoll. It is unclear whether faros are the advanced stage of a

Figure 5. Ebon in the Marshall Islands



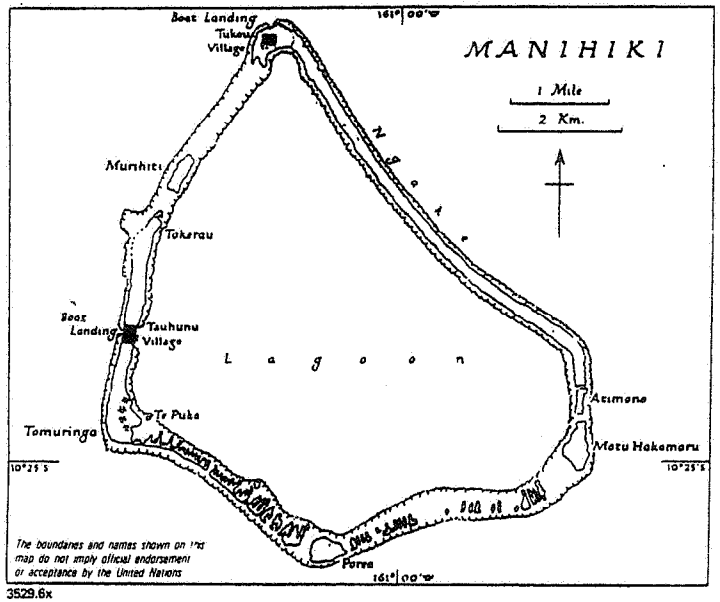
3529.5x

Source: Pacific Islands, vol. IV, Western Pacific, Geographical Handbook Series, British Crown Copyright. Reproduced by permission of the Controller of Her Britannic Majesty's Stationery Office.

subsiding central island or are atolls where the lagoon has been subject to sedimentation and infilling. Ebon in the Marshall Islands (figure 5) and Manihiki in the Cook Islands (figure 6) are faros.

21. The term "fringing reefs" also has a strict meaning in geomorphology. Such reefs are derived from some biological process involving coral, oysters or lime-secreting worms. Such a reef is therefore distinguished from a rock platform which has been cut down by erosion and then perhaps submerged by rising sea levels. The fringing reef is constructed as a framework by marine animals and then filled and consolidated by sedimentation. An example of a fringing reef in the strict geomorphological sense is found around Rarotonga in the Cook Islands. This attached coral reef varies in width from 50 to 450 metres. If, however, as in this case it forms a continuous area of reef uncovered at low water, and contiguous with the shore line, the provisions of article 5 will apply. In some instances, the reef may be separated from the low-water line of the island by a narrow lagoon, and there may be small channels through the reef.

Figure 6. Manihiki in the Cook Islands



Source: Pacific Islands. vol. II, Eastern Pacific, Geographical Handbook Series, British Crown Copyright. Reproduced by permission of the Controller of Her Britannic Majesty's Stationery Office.

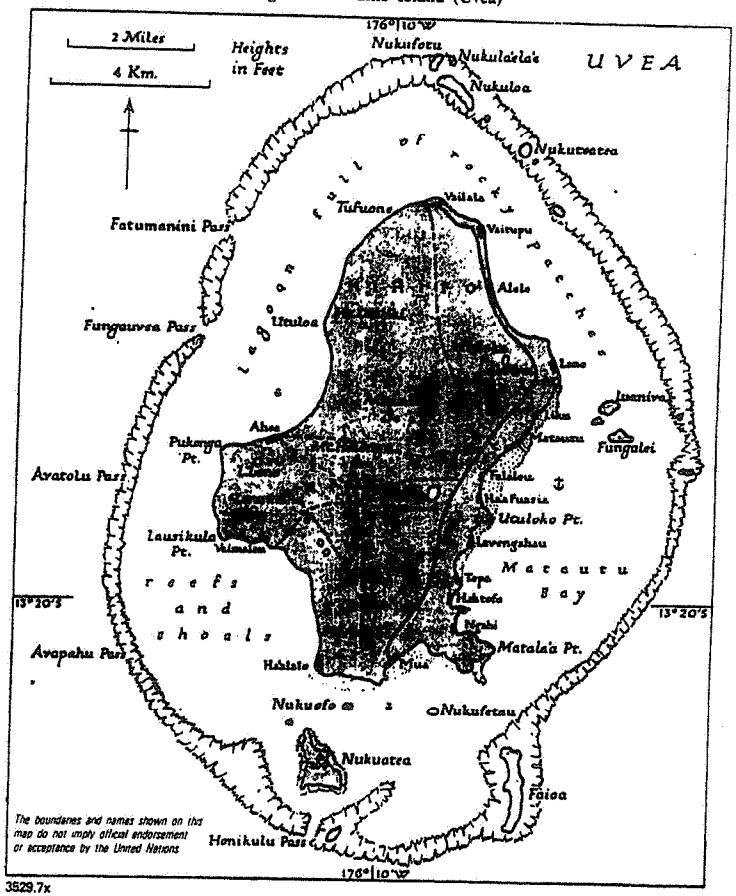
22. Reefs which have formed around an island at some distance from the island so that a lagoon is created are known as barrier reefs. The Iles Wallis are surrounded by a barrier reef which is surmounted by some islands large enough to support plantations (figure 7). Islands surrounded by barrier reefs look like almost-atolls although they are technically distinct because the islands are not subsiding.

23. It may be assumed that the reference to fringing reefs in article 6 can be applied without distinction to any reefs, including barrier reefs, which are separated from the low-water line of the island and form a fringe along its shore.

24. A particular point to be noted is that the article only permits use of the charted low-water line of the reefs as baselines. Reefs, or parts of reefs, charted as being below the level of chart datum may not be used as baselines.

25. The article, however, does not deal with the status of the lagoon waters of an atoll or the waters enclosed by fringing reefs. Lagoon waters are usually sufficiently closely linked to the land domain to be subject to the régime of internal waters. Lagoons also have some of the characteris-

Figure 7. Wallis Island (Uvea)



Source: Pacific Islands, vol. III, Western Pacific, Geographical Handbook Series, British Crown Copyright. Reproduced by permission of the Controller of Her Britannic Majesty's Stationery Office.

tics of bays which have more than one mouth; the waters are land-locked and would almost certainly satisfy the semi-circle test set out in article 10. Furthermore, paragraph 7 of article 47, dealing with archipelagos, permits these waters to be counted as land when computing water to land ratios. It may therefore be inferred that the enclosed waters can be regarded as being internal waters.

26. Most atolls possess one or more channels through the reefs. For example, Truk has twelve channels suitable for the passage of vessels

(figure 4). If the lagoon waters of atolls are to be considered as internal waters it follows that it will be necessary to construct closing lines across the entrance channels. Tokelau has grappled with this problem. In article 5 of Tokelau's Territorial Seas and Exclusive Economic Zone Act 1977, dated 23 December 1977, the baseline is described in the following terms: "The baseline from which the breadth of the territorial sea is measured shall be the low-water line along the seaward edge of the reef, except that where there is a break or passage through or over the reef, the baseline shall be a straight line joining the extreme points of that break or passage."

27. The problem of channels through the reefs becomes greater in the case of fringing reefs where the reef is incomplete in sections measuring a few miles, or where the reef fringes only a part of the island. An example of this situation is provided by the Louisiade Archipelago of Papua New Guinea (figure 8).[4] There are plainly sections of the reef to the north, east and south of Taluga where it would seem appropriate to position the baseline along their seaward low-water lines. But there is a gap of about 23 miles in the reef east of the Duchetau Islands. Figure 9 shows a hypothetical case based on geographical reality where there is a pronounced fringing reef to the north and west of the islands. In both cases there are large areas of water adjacent to the island which are not enclosed by the fringing reefs and which should not be treated as internal waters. In both cases, also, it appears difficult to find a justifiable means of converting the waters landward of the complete section of reef into internal waters.

28. If a fringing reef is found along only one side of an island there is a problem of how to link the island to the reef in order to close the internal waters. It would probably be reasonable to use the shortest possible line.

29. "Appropriate symbols" refers to the standard symbol for reefs used in nautical charts.

C. Low-tide elevations

Article 13
Low-tide elevations

1. A low-tide elevation is a naturally formed area of land which is surrounded by and above water at low tide but submerged at high tide. Where a low-tide elevation is situated wholly or partly at a distance not exceeding the breadth of the territorial sea from the mainland or an island, the low-water line on that elevation may be used as the baseline for measuring the breadth of the territorial sea.

2. 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.

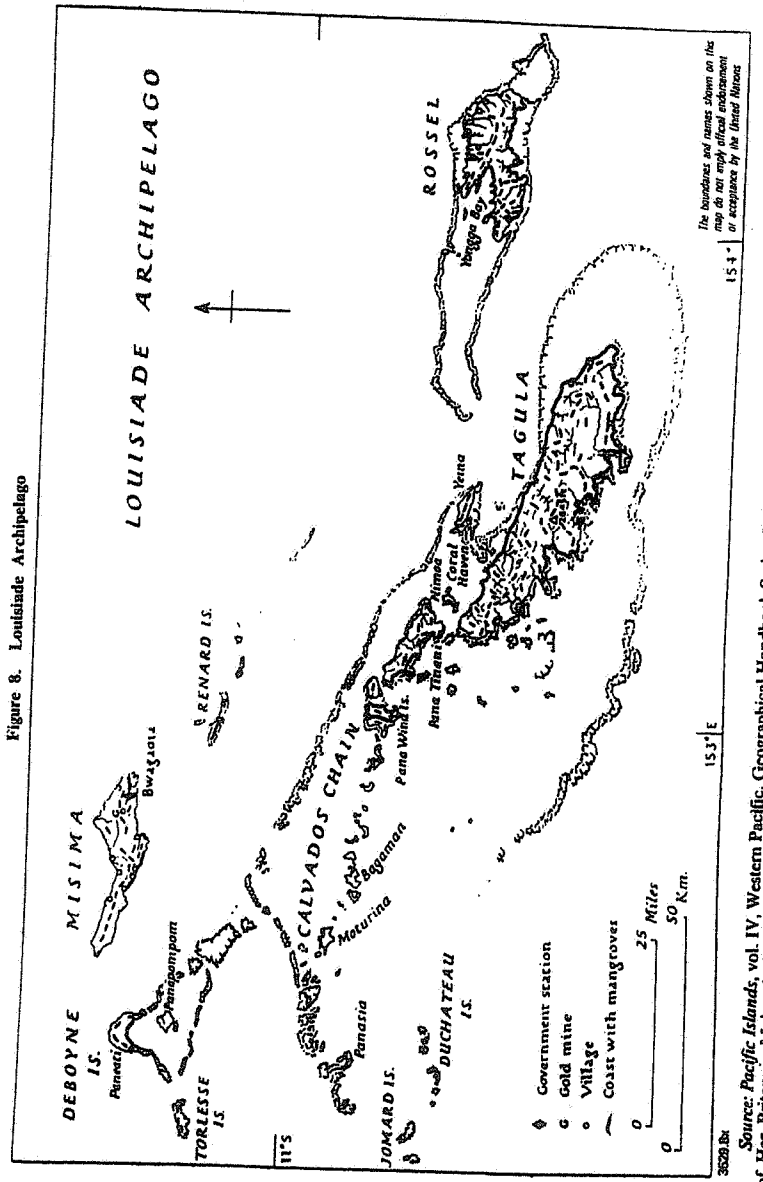
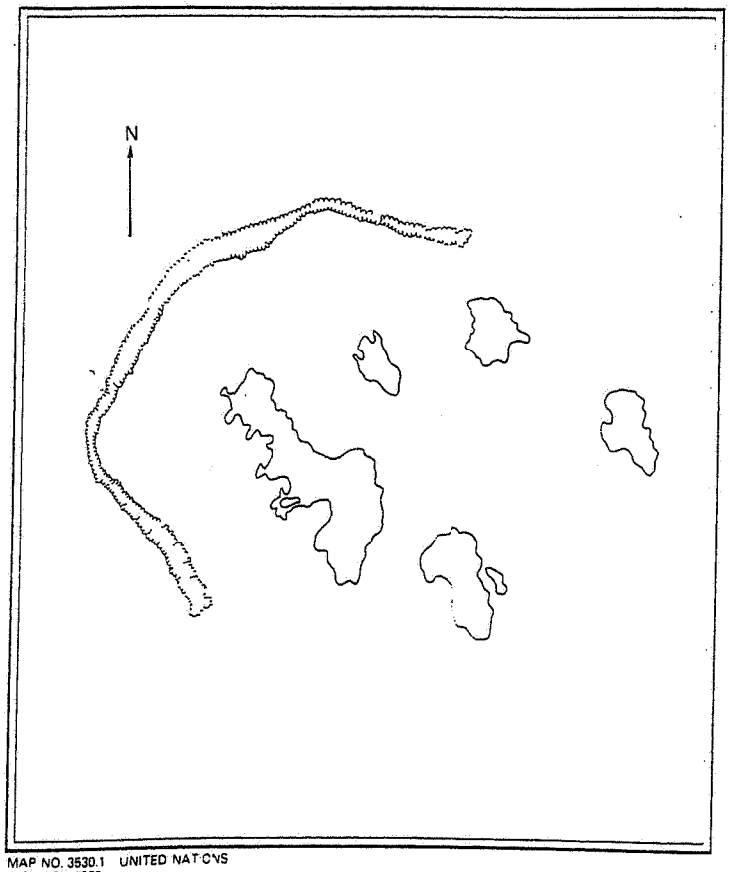


Figure 8. Louisiade Archipelago

Source: Pacific Islands, vol. IV, Western Pacific, Geographical Handbook Series, British Crown Copyright. Reproduced by permission of the Controller of Her Britannic Majesty's Stationery Office.

Figure 9. Hypothetical group



MAP NO. 3530.1 UNITED NATIONS
JANUARY 1989

30. A low-tide elevation is an inter-tidal feature and is only visible in calm seas at certain stages of the tide, but not at high tide. When there is a cluster of low-tide elevations, the authorities producing charts may often mark the whole area as drying at low water without necessarily identifying each individual feature which stands above the low-water level. For that reason, it is often necessary to consult the largest-scale chart of the area, since it is more likely to differentiate the individual features and make it possible to determine which low-tide elevations may be used for measuring the breadth of the territorial sea.

31. It is made quite clear that the low-tide elevations which may be used as baselines are those which are wholly or partly at a distance not

exceeding the breadth of the territorial sea measured from the mainland or an island.

32. The application of this rule is shown in figure 10. There are four low-tide elevations in this diagram, only two of which may be used to generate territorial seas. That marked B is wholly within the breadth of the territorial sea measured from the mainland, while the low-tide elevation marked C is partly within that zone. Both B and C may be used as baselines. The low-tide elevation marked D is outside the breadth of the territorial seas measured from the mainland and may not be used; the fact that it is within the territorial sea measured from B and C is not relevant. The low-tide elevation marked A may not be used to claim additional territorial seas because it lies outside the breadth of the territorial sea measured from the mainland. The fact that it lies within the territorial sea measured from the bay's closing line does not bring it within the scope of article 13. There is, however, a United States Supreme Court judgement to the contrary.[5]

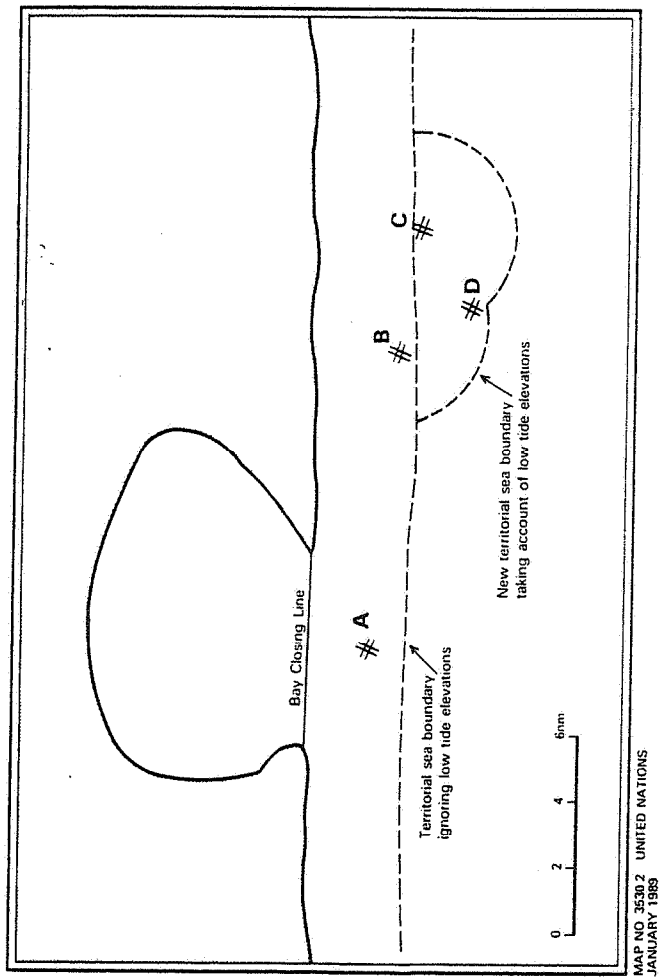


Figure 10. Low-tide elevations (after P. B. Beazley, 1978, p. 25)

Chapter II

STRAIGHT BASELINES

33. Straight baselines may be substituted for the normal baseline along sections of the coast which meet the conditions laid down in article 7.

Article 7

STRAIGHT BASELINES

1. 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, the method of straight baselines joining appropriate points may be employed in drawing the baseline from which the breadth of the territorial sea is measured.

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

3. The drawing of straight baselines must not depart to any appreciable extent from the general direction of the coast, and the sea areas lying within the lines must be sufficiently closely linked to the land domain to be subject to the régime of internal waters.

4. 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.

5. Where the method of straight baselines is applicable under paragraph 1, account may be taken, in determining particular baselines, of economic interests peculiar to the region concerned, the reality and the importance of which are clearly evidenced by long usage.

6. The system of straight baselines may not be applied by a State in such a manner as to cut off the territorial sea of another State from the high seas or an exclusive economic zone.

34. Article 7 repeats almost verbatim article 4 of the 1958 Convention which was born out of the Judgment given to the Anglo-

Norwegian Fisheries Case by the International Court of Justice.[6] Straight baselines may be drawn along coasts which are deeply indented and cut into, or which have a fringe of islands in the immediate vicinity. The straight baselines must be drawn to satisfy requirements dealing with the general direction of the coast, the linkage to the land domain for the sea areas lying within the lines to be subject to the régime of internal waters, the use of low-tide elevations and the access of other countries to their exclusive economic zone or the high seas.[7]

A. Deeply indented coasts

35. In determining whether the conditions apply which would permit the use of straight baselines it is necessary to focus on the spirit as well as the letter of the first paragraph of article 7. It is possible to have different views on this, but the following suggestion seems reasonable. The concept of straight baselines is designed to avoid the tedious application of rules dealing with the normal baselines and the mouths of rivers and bays, where their application would produce a complex pattern of territorial seas. A hypothetical example is shown in figure 11. It demonstrates that the application of articles 5 and 10 would create enclaves and deep pockets of non-territorial seas. Such a pattern might create considerable difficulties for both observance of the appropriate régime and surveillance.

36. It would be possible to construct a model of a length of coastline formed by a smooth, unindented coast at one end and a very deeply indented coast at the other end. If this model was then submitted to a number of geographers, surveyors and lawyers who were asked to mark the point which separated deeply indented coasts from others, it is safe to predict that a number of different points would be selected. So far, no objective test which has received general acceptance has been developed to enable experts to agree on the identification of deeply indented coasts. It is generally agreed, however, that there must be several indentations which individually would satisfy the conditions establishing a juridical bay (see article 10), though there may be other less marked indentations associated with them.

37. The degree of complexity in the pattern of territorial seas will usually decrease as the claimed width of territorial seas increases. For example, some of the very complex patterns which exist at present in Australia's Great Barrier Reef will disappear entirely if Australia decides to increase its claim to the territorial sea from 3 nautical miles to 12 nautical miles. But such an increase may not necessarily eliminate all the problems.

38. By the judicious selection of a system of straight baselines it may be possible to eliminate potentially troublesome enclaves and deep pockets of non-territorial seas without significantly pushing the seaward limits of the territorial seas away from the coast (figure 12).

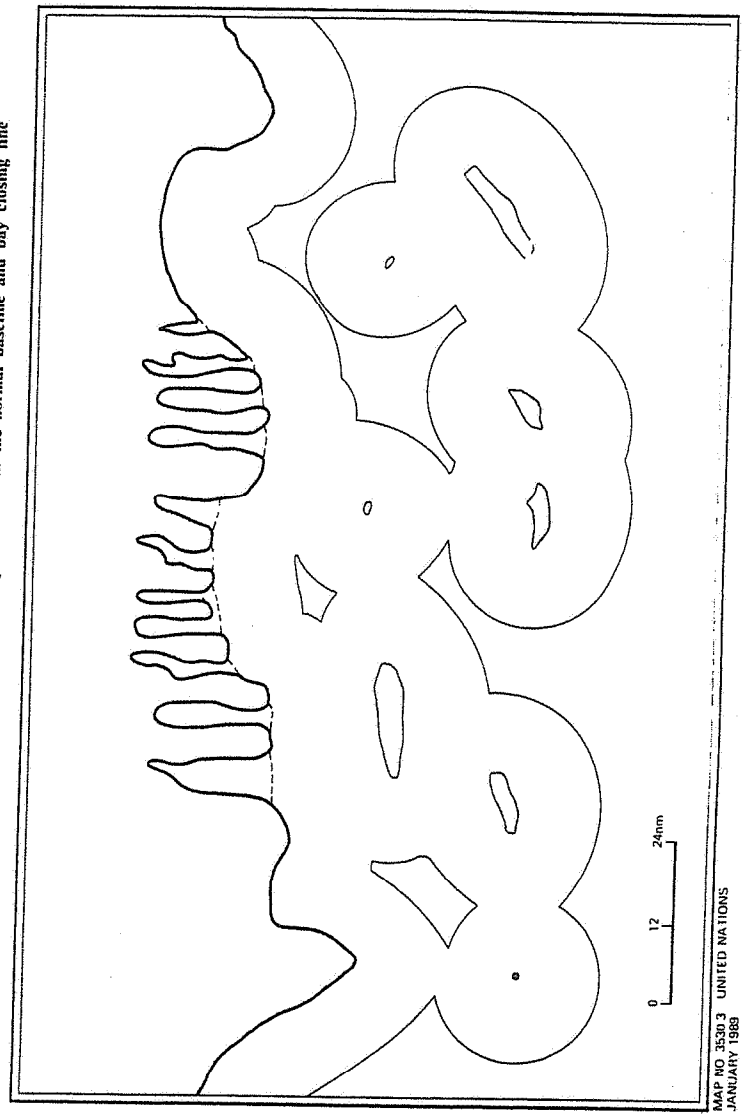


Figure 11. A complex pattern of territorial waters produced from the normal baseline and bay closing line

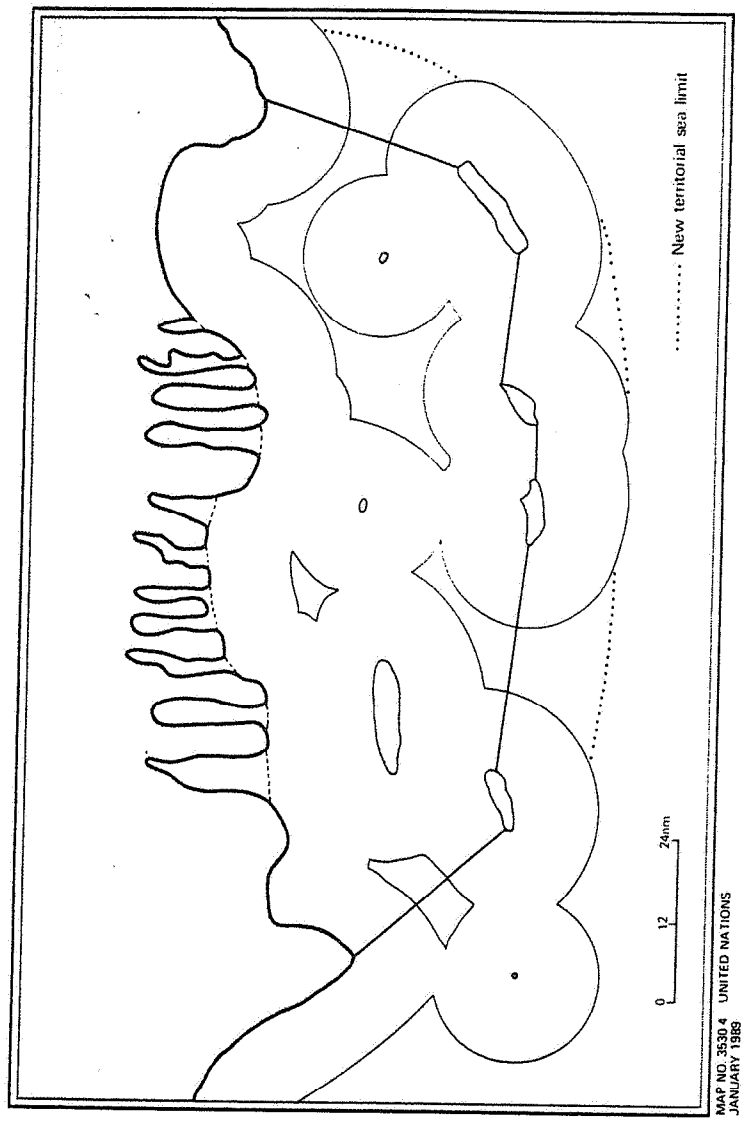


Figure 12. The role of straight baselines in simplifying territorial sea boundaries

39. The spirit of article 7, in respect of indented coasts and fringing islands, will be preserved if straight baselines are drawn when the normal baseline and closing lines of bays and rivers would produce a complex pattern of territorial seas and when those complexities can be eliminated by the use of a system of straight baselines. It is not the purpose of straight baselines to increase the territorial sea unduly.

40. The term "deeply indented" may be used in either an absolute or a relative sense. For example, in absolute terms a narrow indentation measuring four nautical miles in a relatively large land territory may not merit the description deep, but on an island eight miles wide an indentation of that length cuts across half the island.

B. Fringe of islands

41. While the phrase "deeply indented and cut into" travelled intact from the 1951 Anglo-Norwegian Fisheries case Judgment to the 1982 United Nations Convention via the 1958 Convention, the phrase "a fringe of islands along the coast in its immediate vicinity" appears to be a widening of the phrase used in the Judgment: "or where it (a coast) is bordered by an archipelago such as the 'skjaergaard'".

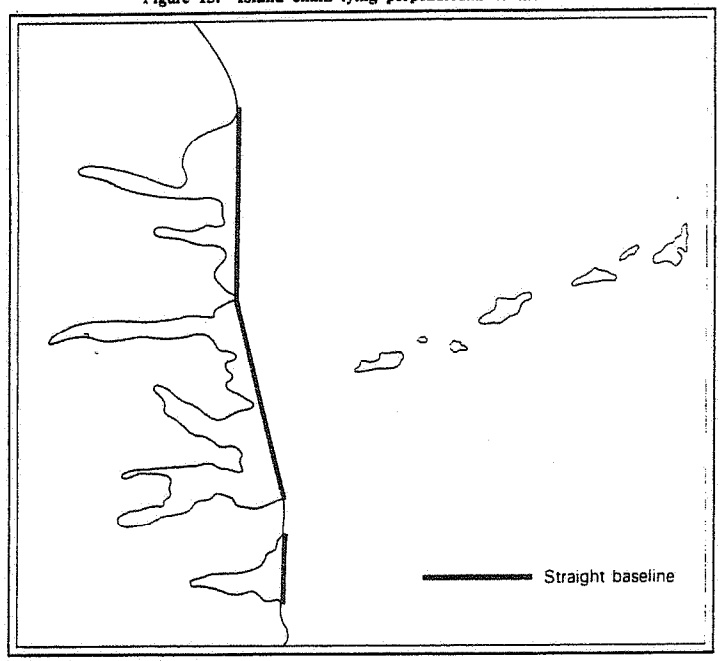
42. There is no uniformly identifiable objective test which will identify for everyone islands which constitute a fringe in the immediate vicinity of the coast. States should, however, be guided by the general spirit of article 7.

43. There are still some points which must be made about the concept of a fringe and the interpretation of the phrase "in the immediate vicinity". Clearly there must be more than one island in the fringe but it is difficult to specify any particular minimum number. Since the fringe has to be "along the coast" this provision would not, therefore, apply to islands arranged like stepping-stones perpendicular to the coast (figure 13).

44. There are generally two situations where a fringe of islands is likely to exist. The first, which is related closely to the 1951 Anglo-Norwegian Fisheries case Judgment, deals with islands which appear to form a unity with the mainland. Such islands appear to be dovetailed into the coast and on small-scale maps appear to be a continuation of the mainland. Much of the *skjaergaard* of north Norway provides an example of this condition (figure 14).

45. The second situation occurs when islands which are some distance from the coast form a screen which masks a large proportion of the coast from the sea. For example the islands along the coast of Yugoslavia from Pula to Sibenik typify linear islands which mask the coast and form a fringe. However the coast may be screened by a swarm of small islands which by their number justify consideration as a fringe. The myriad islands called the Archipelago of the Recherche off the coast of Western Australia provide a good example of a fringe of small islands.

Figure 13. Island chain lying perpendicular to the coast



MAP NO. 3530.5 UNITED NATIONS
JANUARY 1989

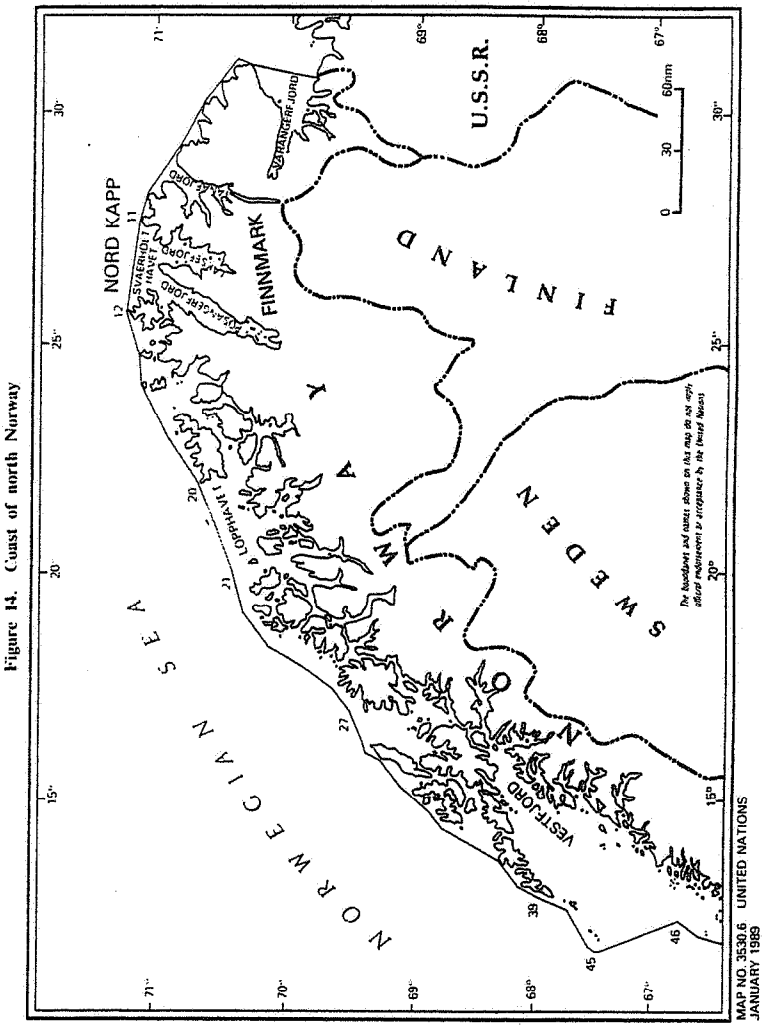
C. Immediate vicinity

46. The descriptive phrase "in its (the coast's) immediate vicinity" is a concept which has a clear meaning but for which there is no absolute test. While a fringe of islands three nautical miles from the coast may be considered as being in its immediate vicinity, a fringe 100 nautical miles distant would not. It is generally agreed that with a 12-mile territorial sea, a distance of 24 miles would satisfy the conditions. The distance that has been proposed in the literature as a general rule is 48 miles,[8] which could be exceeded in certain circumstances, but this figure is not necessarily widely agreed upon. (Whether or not the enclosed waters are subject to the régime of internal waters must, of course, be taken into account. This matter is considered later.) It is important to realize that this concept applies to the inner edge of the fringe of islands because the fringe itself might be of considerable width.

D. The characteristics of straight baselines

47. Having set out the two basic circumstances which might justify the use of straight baselines, article 7 then prescribes rules which either

Figure 14. Coast of north Norway



MAP NO. 3530.6 UNITED NATIONS
JANUARY 1989

apply to particular cases or must be satisfied when the baselines are drawn.

Deltas

48. Article 7, paragraph 2 relates to deltas. Three points need to be noted. First, this paragraph is subordinate to paragraph 1, and is not an alternative to it. In other words, for paragraph 2 to apply the coastline of the delta must satisfy the conditions set out in paragraph 1.[9] Secondly, paragraph 2 of the article refers to "a delta and other natural conditions" so that for this paragraph to apply there must be a delta. Thirdly, the coastline must be "highly unstable".

49. The provisions of this paragraph were introduced for the first time in the 1982 Convention. States may draw straight baselines around the low-water line of a delta, the coastline of which is highly unstable, and are not obliged to amend the basepoints for every charted change that takes place thereafter. It is expected by the terms of article 7 that the basepoints will eventually be changed by the coastal State in accordance with the Convention. This will presumably take place when it becomes clear that the low-water line has significantly and permanently advanced or retreated from the positions originally used.

50. Guidance on the sort of conditions envisaged by the drafters of this article may be gained from the knowledge that it was drafted with the specific case of the Ganges/Brahmaputra River delta in mind. This is the largest delta in the world, encompassing some 60,000 square kilometres, over half of which is inundated by tidal waters. Monsoons and storms can cause extremely rapid changes, sweeping away islands, altering the course of channels, and forming new islands in a very short space of time. It is clearly such conditions that provide a guide to what might be considered a highly unstable coastline. It should be noted that such changes do not necessarily involve an overall advance or retreat of the coastline. In the case of the Ganges delta the general seaward extent of much of the coastline is relatively stable.

Location of basepoints

51. The second rule deals with the use of appropriate points to define the system of straight baselines and particular reference is made to the possibility of using low-tide elevations. Appropriate points must be located on the territory of the State drawing the baselines and should be located on or above the charted low-water line[10] used in other parts of the coast as the normal baseline. Furthermore, the straight baseline system must be closed. This means that whether the baselines are drawn along the coast of an island or of the mainland, the system must start and finish on or above the low-water line,[11] and if straight baselines are drawn to connect a fringe of islands to the mainland or a large island, all the intermediate basepoints must be located on or above the low-water line. Thus the internal waters which the straight baselines create must be totally surrounded by a combination of straight baseline segments, and

islands where applicable, and the coastline to which the straight baseline system is joined (see article 14).

Low-tide elevations

52. There are only two circumstances in which low-tide elevations may be used for the location of points defining a system of straight baselines (article 7, paragraph 4). The first is when the low-tide elevation is surmounted by a lighthouse or similar installation. There appears to be little ambiguity about this provision. A low-tide elevation is clearly defined in article 13 and a lighthouse is unmistakable. Installations similar to a lighthouse can take two forms. One, they could be towers and buildings which look like a lighthouse without serving any purpose specifically connected with navigation; and two, the similarity could be related to the function of lighthouses which is to warn navigators of danger and assist them in fixing their position. Such features could be foghorns, beacons and radar reflectors for example, although it may be assumed that any such features should be clearly visible at all states of the tides.

53. The second circumstance allows low-tide elevations to be used in the construction of straight baselines if their use for that purpose has received general recognition. This stipulation has particular reference to Norway which has used low-tide elevations without structure on them as basepoints for the straight baselines that were accepted by the International Court of Justice.[12]

General direction

54. The rule in article 7, paragraph 3 requires that straight baselines should not depart to any appreciable extent from the general direction of the coast. This concept appeared in the 1951 Anglo-Norwegian Fisheries case Judgment but it was also noted that the concept "is devoid of any mathematical precision". Attempts have been made to add precision by an analysis of the Norwegian baseline system. It was found that with the solitary exception of Vest fjord the straight lines did not diverge from the general direction of the coast by more than approximately 15 degrees. A maximum of 20 degrees has been suggested as a general rule.[13] This is qualified, however, by the observation that the fringe as a whole might lie parallel to the coast, but that the geographical configuration might be such that the lines joining it to the coast must form an angle greater than 20 degrees.

55. Apart from the lack of any exact deviation which could be used to test the correctness of any straight baseline there is the prior difficulty of agreeing on the general direction of the coast. The Anglo-Norwegian Fisheries case Judgment stated that except in the case of manifest abuse it was unsatisfactory to examine one sector alone, or to rely on the impressions gained from large-scale charts. Nevertheless, it cannot be supposed that there is not some limit to the extent of coastline to be considered when judging any particular line. Perhaps it should be related

to, but not necessarily the same as, the maximum length of baseline considered to be acceptable.[14]

56. Finally it should be noted that this requirement does not deal in any way with the distance between the mainland and the straight baseline: it deals solely with the congruence of two bearings.

Régime of internal waters

57. The problem of distance between the baseline and the mainland is the subject of the rule set out in article 7, paragraph 3, which requires that sea areas lying landwards of the straight baseline "must be sufficiently closely linked to the land domain to be subject to the régime of internal waters". This is another phrase taken from the 1951 Anglo-Norwegian Fisheries case Judgment. The judges linked this concept to the basis of the determination of the rules relating to bays. They also observed that the concept should be liberally applied in the case of coasts like those of Norway. Unfortunately it has not proved possible to develop a mathematical test to justify the application of this rule. The spirit of the rule is clearly that internal waters must be in fairly close proximity to land represented by islands or promontories. Sweden, in a statement to the International Law Commission, expressed the view that the criterion of the sufficient and close link means that ". . . the expanse of water in question is so surrounded by land, including islands along the coast, that it seems natural to treat it as a part of the land domain".[15]

Miscellaneous provisions

58. Article 7, paragraph 5 allows "economic interests" peculiar to the region concerned to be taken into account in certain circumstances. Such economic interests are not a justification for straight baselines in the absence of indented coasts or fringing islands; they can only be used to determine the alignment of parts of the baseline system where either or both of those conditions have been satisfied.

59. Since "importance" is a relative term which could apply to a region or a small coastal community, it is unlikely that analysis of this term would clarify the position. The fishing economic interests along the Norwegian coast which prompted this concern by the International Court of Justice had existed for centuries. "Long usage" does not, however, necessarily require such a lengthy time-scale.

60. Article 7, paragraph 6 is clear and succinct. Coastal States may not draw straight baselines which will cut off the territorial sea of a neighbouring country from the high seas or an exclusive economic zone. An example of a country which has carefully observed this requirement is provided by France. France's baselines established by a decree of 19 October 1967 leave Monaco with unrestricted oceans seawards.

Chapter III

SPECIAL LOCAL APPLICATIONS

61. This section deals with the delimitation of the territorial sea in the vicinity of the mouths of rivers, bays, ports and roadsteads.

A. MOUTHS OF RIVERS

Article 9
MOUTHS OF RIVERS

If a river flows directly into the sea, the baseline shall be a straight line across the mouth of the river between points on the low-water line of its banks.

62. This short article contains two matters which deserve comment. First, there is the concept of a river which flows directly into the sea. The authentic French text differs from the authentic English text in that it reads as follows: "si un fleuve se jette dans la mer sans former estuaire" (If a river flows into the sea without forming an estuary. . ., unofficial translation). The phrase "directly" can be interpreted in light of the French text which clearly shows that an estuary has not been formed. Article 9 of the French text is a replica of article 13 of the 1958 Convention. Furthermore, the International Law Commission of 1956, using work done at the 1930 Hague conference, drafted an article of two paragraphs dealing with mouths of rivers, the second of which noted that if a river formed an estuary, it was to be dealt with under the provisions for bays.[16] Thus, the term "directly" can be interpreted to mean "without forming an estuary". However, it can also be noted that estuaries are parts of rivers and that in this present era of rising sea levels there are very few rivers which do not have estuaries.

63. Secondly, article 9 gives no guidance on the selection of the basepoints of the closing line except the requirement that they must be on the low-water line of the river's banks. Although there is reference to "the mouth of the river" this is a zone which can be difficult to define in some cases, i.e. especially along a low coast with a large tidal range. There cannot be any precise answer which will apply in every type of river mouth and this probably explains the general nature of article 9.

64. Closing lines for rivers should either be shown on charts or the

co-ordinates of the ends of the lines should be listed (see article 16). Article 9 applies whether the rivers in question fall within the territory of one country or are shared by two or more countries. Further, there is no restriction on the length of the line closing the river. In these two respects the article dealing with bays is much more restrictive.

B. Bays

Article 10
BAYS

1. This article relates only to bays the coasts of which belong to a single State.

2. For the purposes of this Convention, a bay is a well-marked indentation whose penetration is in such proportion to the width of its mouth as to contain land-locked waters and constitute more than a mere curvature of the coast. An indentation shall not, however, be regarded as a bay unless its area is as large as, or larger than, that of the semi-circle whose diameter is a line drawn across the mouth of that indentation.

3. For the purpose of measurement, the area of an indentation is that lying between the low-water mark around the shore of the indentation and a line joining the low-water mark of its natural entrance points. Where, because of the presence of islands, an indentation has more than one mouth, the semi-circle shall be drawn on a line as long as the sum total of the lengths of the lines across the different mouths. Islands within an indentation shall be included as if they were part of the water area of the indentation.

4. If the distance between the low-water marks of the natural entrance points of a bay does not exceed 24 nautical miles, a closing line may be drawn between these two low-water marks, and the waters enclosed thereby shall be considered as internal waters.

5. Where the distance between the low-water marks of the natural entrance points of a bay exceeds 24 nautical miles, a straight baseline of 24 nautical miles shall be drawn within the bay in such a manner as to enclose the maximum area of water that is possible with a line of that length.

6. The foregoing provisions do not apply to so-called "historic" bays, or in any case where the system of straight baselines provided for in article 7 is applied.

65. It is doubtful whether any other subject dealing with maritime boundaries has inspired more written commentary than article 10.[17] Some of the most detailed analysis of the rules regarding juridical bays has occurred during cases in the United States Supreme Court.[18]

66. The first and last paragraphs in article 10 name three classes of bays which are not covered by these regulations. First, bays which are bounded by more than one country are excluded. Second, historic bays are not covered by these provisions and lastly, bays converted to internal waters by straight baselines under article 7 are not subject to article 10.

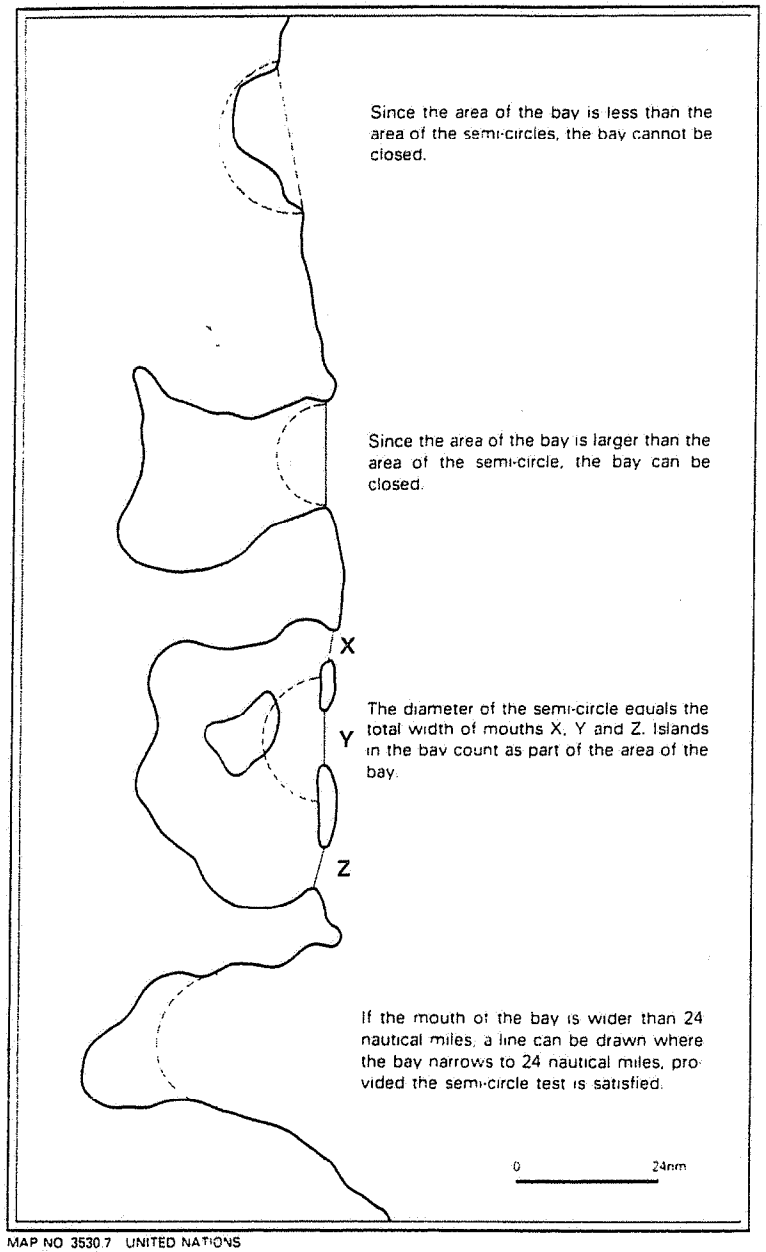
67. The second paragraph provides a subjective description and an objective test by which juridical bays can be identified. The subjective description employs four phrases which can be divided into two pairs. The phrases "a well-marked indentation" and "more than a mere curvature of the coast" convey the same message. It is expected that at its mouth the shore of the bay will exhibit a marked change of direction compared with the general direction of the coast. Similarly the references to "penetration (which) is in such proportion to the width of its mouth" and "landlocked water" describe a configuration so that the bay is surrounded on all sides but one. Even with these useful phrases there is in practice a range of configurations, from a mere curvature of the coast to a very pronounced indentation, which would provoke debate amongst experts about whether any particular indentation was a juridical bay or not. To avoid this difficulty the objective semi-circle test was added. Although, as in figure 15, the area of the bay may be compared cartographically with a semi-circle, there is no need to do this. There is nothing significant about the shape of a semi-circle in applying this test: all that is important is the actual area of a semi-circle.

68. The third paragraph deals with the technical problem of comparing the area of the bay with the area of the appropriate semi-circle. Quite clearly the diameter of the semi-circle is equivalent to the width of the mouth or, if there are islands near its mouths, to the combined widths of the various mouths. Furthermore, it is explicit that the water area of the bay is deemed to include islands within the bay.

69. The definition of the area of the bay to be measured contains two uncertainties. First, it is not clear how to identify the natural entrance points of a bay. Some bays will possess a number of points which might be used, some will have only one natural entrance point, and others may possess smoothly curved entrances on which no single point is distinguished (figure 16). A number of tests have been proposed for objectively identifying natural entrance points. Some may find those tests helpful but others may prefer to use other criteria. Article 10 is silent on the point.

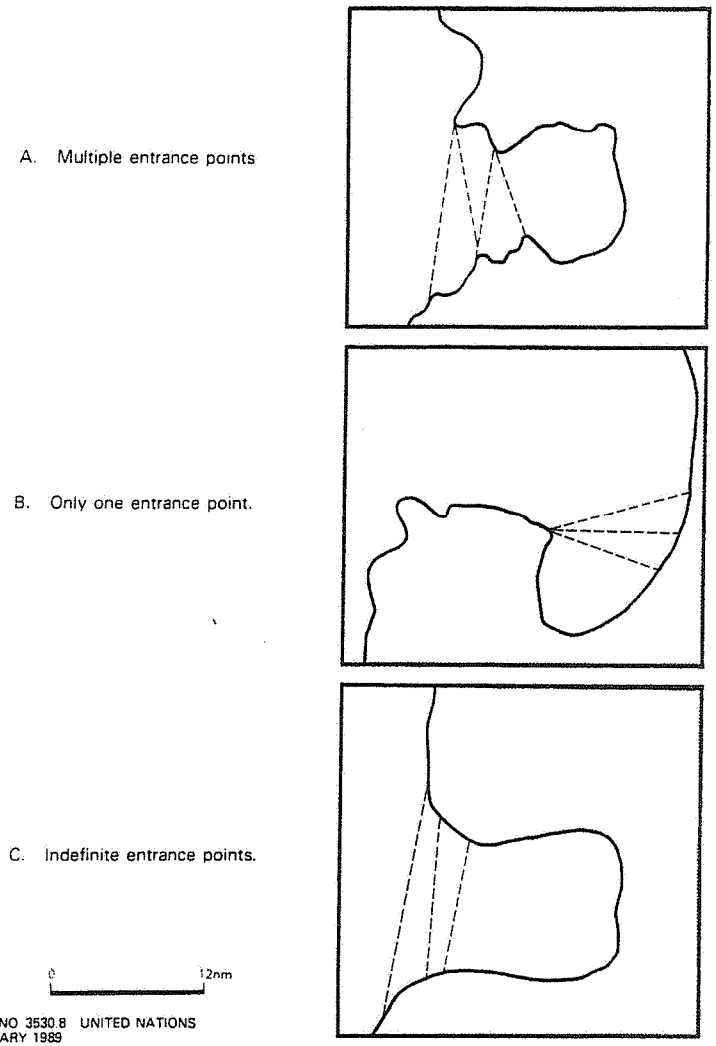
70. The second uncertainty arises from the fact that the area of the bay is deemed to be surrounded by the low-water line around the shore of the indentation and a straight line joining the natural entrance points. The low-water line will be interrupted at the mouths of rivers flowing into the bay, and it could be argued that straight lines should be drawn across such river mouths to link up the low-water lines. However, if the mouth of a river is wide and penetrated by tides then it could be argued that the line across the river should be some distance above the mouth. This will be a problem only if the area of the bay is very close to the area of the semi-

Figure 15. Rules for closing juridical bays



MAP NO. 3530.7 UNITED NATIONS
JANUARY 1989

Figure 16. The problem of finding a bay's natural entrance point

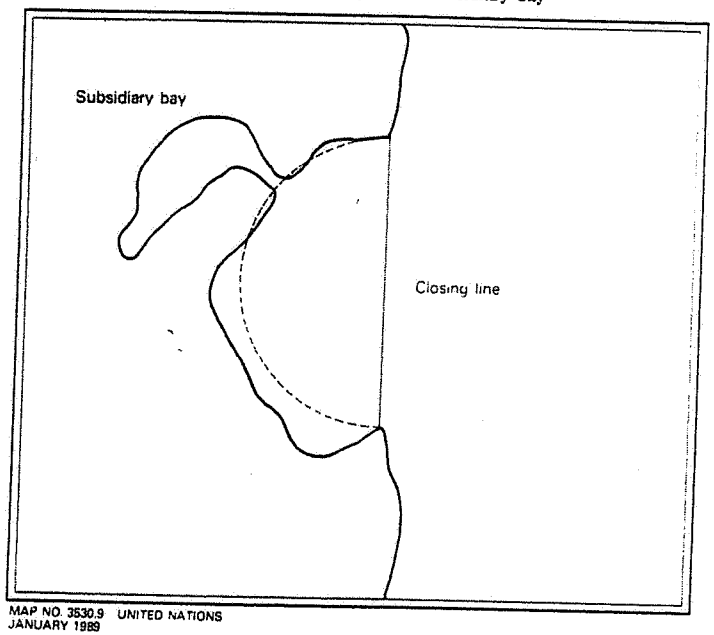


MAP NO. 3530.8 UNITED NATIONS
JANUARY 1989

circle and efforts are being made to ensure that as large an area as possible may be attributed to the bay.

71. In the legal cases mentioned earlier there have been suggestions that waters considered to be subsidiary to the bay should be excluded from the measurement of the bay's area (figure 17). If the shoreline of such areas forms part of the low-water mark and is part of the penetration

Figure 17. Example of a subsidiary bay

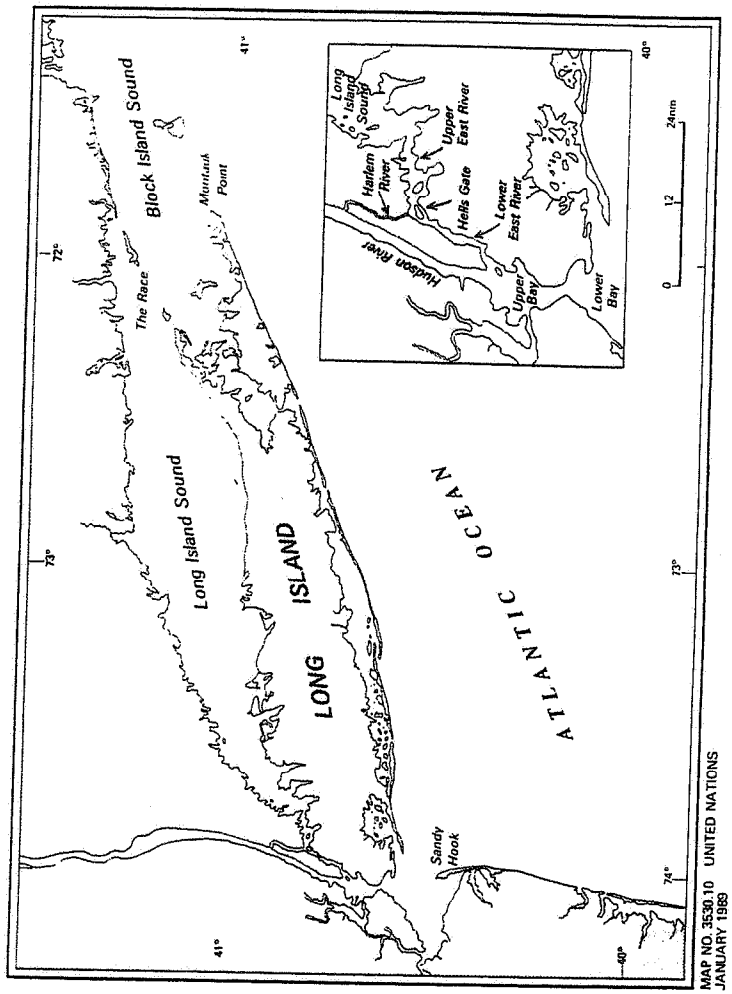


of the sea into the land there appears to be no reason why it should not be counted as part of the area of the bay.[19]

72. Some difficulties may arise regarding the correct course of action if the islands forming different mouths lie seawards of the direct line joining the two natural entrance points or if some of the mouths created by the islands are unnavigable. However, article 10 does not say that the islands have to be in the mouth of the bay. It is only necessary that their presence create more than one mouth. Thus, islands might lie seawards of the direct line between the natural entrance points and still qualify under the terms of article 10. It is then a matter of judgement to decide when such islands lie too far seawards to be considered as forming mouths of the bay.

73. The question of whether a natural entrance point of a bay could be on an island is not covered in the Convention. However, there are situations where relatively large islands extend, or even form one side of a bay such as Long Island, New York (figure 18). In such a case it might be justifiable to use a point on the island as one of the natural entrance points.[20] However, it would still be necessary to close the baseline by drawing a line to join the island to the coast. Of course, it could be argued that in such cases the bay has two mouths even though one might not be navigable. Article 10, paragraph 3 does not deal with the navigability of entrances to bays.

Figure 18. Long Island, New York



74. Paragraphs 4 and 5 of article 10 specify that the maximum length of any closing line or lines is 24 nautical miles. If the mouth of the bay exceeds that distance the closing line may be drawn anywhere within the bay so as to enclose the maximum area of water possible (figure 15).

75. Article 16 requires that coastal States shall give due publicity to the location of closing lines for bays and deposit copies of charts and lists of geographical co-ordinates with the Secretary-General of the United Nations.

C. Ports

Article 11
PORTS

For the purpose of delimiting the territorial sea, the outermost permanent harbour works which form an integral part of the harbour system are regarded as forming part of the coast. Off-shore installations and artificial islands shall not be considered as permanent harbour works.

76. Under this article permanent features which form an integral part of the harbour systems are regarded as forming part of the coast. This would include features like detached breakwaters which form an integral part of the harbour system. On the other hand, offshore installations and artificial islands are not to be considered as permanent harbour works.

77. Article 50 allows archipelagic States to draw closing lines to create internal waters in accordance with articles 9, 10 and 11. From this it may be inferred that closing lines may be drawn across the entrances to the port.

D. Roadsteads

Article 12
ROADSTEADS

Roadsteads which are normally used for the loading, unloading and anchoring of ships, and which would otherwise be situated wholly or partly outside the outer limit of the territorial sea, are included in the territorial sea.

78. This article corresponds to article 9 in the 1958 Convention except that the 1958 requirement to show the boundaries of roadsteads on charts has been transferred to article 16. Article 12 does not deal with baselines but with the outer limit of the territorial sea. It seems likely that in 1958, when many countries still claimed territorial seas of three

nautical miles wide, there were a number of roadsteads which lay outside the territorial seas. With the general movement to adopt a 12 nautical mile territorial sea the number of roadsteads still outside the territorial seas must have been considerably reduced. If part of the roadstead overlaps the territorial sea it is simply necessary to extend the territorial sea boundary to enclose that part of the roadstead lying beyond the normal territorial sea limit. If no part of the roadstead overlaps the territorial sea, then the roadstead is presumably to be treated as a detached area of territorial sea; such a circumstance is probably unlikely.

E. Combination of methods

Article 14
COMBINATIONS OF METHODS 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.

79. This article permits States to use whichever of the baseline rules is appropriate for any section of the coast.

F. Archipelagic baselines

Article 46
USE OF TERMS

For the purposes of this Convention:

(*a*) "archipelagic State" means a State constituted wholly by one or more archipelagos and may include other islands;

(*b*) "archipelago" means a group of islands, including parts of islands, interconnecting waters and other natural features which are so closely interrelated that such islands, waters and other natural features form an intrinsic geographical, economic and political entity, or which historically have been regarded as such.

Article 47
ARCHIPELAGIC BASELINES

1. An archipelagic State may draw straight archipelagic baselines joining the outermost islands and drying reefs of the archipelago provided that within such baselines are included the main islands and an area in which the ratio of the area of the water to the area of the land, including atolls, is between 1 to 1 and 9 to 1.

2. The length of such baselines shall not exceed 100 nautical miles, except that up to 3 per cent of the total number of baselines

enclosing any archipelago may exceed that length, up to a maximum length of 125 nautical miles.

3. The drawing of such baselines shall not depart to any appreciable extent from the general configuration of the archipelago.

4. Such 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 where a low-tide elevation is situated wholly or partly at a distance not exceeding the breadth of the territorial sea from the nearest island.

5. The system of such baselines shall not be applied by an archipelagic State in such a manner as to cut off from the high seas or the exclusive economic zone the territorial sea of another State.

6. If a part of the archipelagic waters of an archipelagic State lies between two parts of an immediately adjacent neighbouring State, existing rights and all other legitimate interests which the latter State has traditionally exercised in such waters and all rights stipulated by agreement between those States shall continue and be respected.

7. For the purpose of computing the ratio of water to land under paragraph 1, land areas may include waters lying within the fringing reefs of islands and atolls, including that part of a steep-sided oceanic plateau which is enclosed or nearly enclosed by a chain of limestone islands and drying reefs lying on the perimeter of the plateau.

8. The baselines drawn in accordance with this article shall be shown on charts of a scale or scales adequate for ascertaining their position. Alternatively, lists of geographical co-ordinates of points, specifying the geodetic datum, may be substituted.

9. The archipelagic State shall give due publicity to such charts or lists of geographical co-ordinates and shall deposit a copy of each such chart or list with the Secretary-General of the United Nations.

80. Article 47 contains nine paragraphs which deal with the rules for drawing archipelagic baselines, safeguards for neighbouring States which might be affected, and the recording and publication of archipelagic baselines.

81. The first three paragraphs set out five tests which archipelagic baselines must satisfy. They must include the main islands; they must enclose an area of sea at least as large as the area of enclosed land but not more than nine times that land area; no segment of baseline may exceed 125 nautical miles in length; not more than 3 per cent of baseline segments may exceed 100 nautical miles in length; and the baselines must not depart to any appreciable extent from the general configuration of the archipelago.

82. Each of these tests must be examined in turn. The expression "main islands" could be interpreted in a variety of ways. For different

countries the main islands might mean the largest islands, the most populous islands, the most economically productive islands, or the islands which are pre-eminent in an historical or cultural sense.

83. The test (article 47, paragraph 2) that only 3 per cent of baseline segments may exceed 100 nautical miles in length appears to be strict. But it is easy to calculate that systems with 2 to 33 segments may not have any individual lines more than 100 nautical miles long while systems with 167 to 199 segments may include 5 lines with lengths greater than 100 nautical miles. Since there is no restriction on the number of segments a country can draw, and since the more segments used the closer the system is likely to be to the general configuration of the archipelago, it will usually be possible to adjust the number of segments to secure the necessary number of very long baselines.

84. The requirement that the baselines should not depart to any appreciable extent from the general configuration of the archipelago is similar to the requirement in article 7 that baselines should conform to the general direction of the coast.

85. Plainly the test which establishes the ratio of water to land will be capable of consistent application if there is no uncertainty about what is water and what is land. Paragraph 7 introduces two conditions under which the land area may be increased for the purposes of the calculation. First, waters within fringing reefs of islands and atolls may be counted as land. It was noted earlier that where reefs around atolls or fringing reefs of islands are incomplete, problems of applying article 6 are encountered. The same problems would exist in applying this qualification. Secondly, waters lying over that part of a steep-sided oceanic plateau which is enclosed or nearly enclosed by a chain of limestone islands and drying reefs may be counted as land.[21] There might be difficulties in deciding whether particular formations could be properly judged to nearly enclose a specific plateau.[22]

86. There is no problem in determining whether the length of any segment is greater than 125 nautical miles.

87. The points which may be connected by the baselines include both low-tide elevations which lie within the breadth of the territorial sea measured from land, and those low-tide elevations which lie beyond that distance if they are surmounted by a lighthouse or similar installation. This rule combines the provisions of both articles 13, paragraph 1 and 7, paragraph 4 and so differs from the rules for applying the method of straight baselines. Both articles have already been discussed earlier.

88. As with the method of straight baselines, archipelagic baselines must not be drawn in a manner which would cut off the territorial sea of a neighbouring country from the high seas or the exclusive economic zone.

89. The sixth paragraph deals with situations where the archipelagic waters of one State lie between two parts of an adjacent country. This situation is found between the Malaysian mainland and Sarawak by the extension of Indonesia's archipelagic waters associated with the Kepu-

lauan Anambas and Kepulauan Bunguran. The paragraph provides that existing rights and all other legitimate interests which the neighbouring country has traditionally exercised in those waters and all rights stipulated by agreement between the archipelagic State and the neighbouring State will continue and be respected.

90. The last two paragraphs in article 47 deal with the recording and publication of archipelagic baselines. These provisions will be considered with article 16 in the next section.

91. Two additional points should be noted. First, those States which from a geographical point of view can be considered archipelagos, but which either are not archipelagic States within the meaning of article 46 or cannot satisfy the five tests listed in article 47, may use the system of straight baselines under article 7 along appropriate parts of its coast. This is most likely to apply to those archipelagos which cannot enclose within archipelagic baselines an area of sea at least equal to the area of land. Those States which could enclose an area of water more than nine times the area of land are often composed of small islands where the conditions outlined in article 7 are not usually present.

92. Secondly there seems to be no objection to archipelagic States drawing archipelagic baselines around those islands where the five tests can be satisfied, and leaving other islands outside the archipelagic baselines.[23] This would mean that if an archipelagic State consisted of a number of archipelagos, as provided for in article 46 (A), it could draw separate systems of archipelagic baselines around the different groups.[24] If States draw more than one set of archipelagic baselines each set must individually satisfy the five tests.

Article 50

DELIMITATION OF INTERNAL WATERS

Within its archipelagic waters, the archipelagic State may draw closing lines for the delimitation of internal waters, in accordance with articles 9, 10 and 11.

93. Article 50 permits archipelagic States which have drawn archipelagic baselines to create internal waters by constructing closing lines in accordance with articles 9, 10, and 11. This article, however, does not permit the creation of internal waters by the application of article 7 within a system of archipelagic baselines.

Chapter IV

THE MARKING OF BASELINES ON CHARTS, THEIR PUBLICITY AND THE OBLIGATION TO DEPOSIT COPIES WITH THE SECRETARY-GENERAL OF THE UNITED NATIONS

Article 16

CHARTS AND LISTS OF GEOGRAPHICAL CO-ORDINATES

1. The baselines for measuring the breadth of the territorial sea determined in accordance with articles 7, 9 and 10, or the limits derived therefrom, and the lines of delimitation drawn in accordance with articles 12 and 15 shall be shown on charts of a scale or scales adequate for ascertaining their position. Alternatively, a list of geographical co-ordinates of points, specifying the geodetic datum, may be substituted.

2. The coastal State shall give due publicity to such charts or lists of geographical co-ordinates and shall deposit a copy of each such chart or list with the Secretary-General of the United Nations.

Article 47

ARCHIPELAGIC BASELINES

. . .

8. The baselines drawn in accordance with this article shall be shown on charts of a scale or scales adequate for ascertaining their position. Alternatively, lists of geographical co-ordinates of points, specifying the geodetic datum, may be substituted.

9. The archipelagic State shall give due publicity to such charts or lists of geographical co-ordinates and shall deposit a copy of each such chart or list with the Secretary-General of the United Nations.

94. The requirement to show normal baselines on charts contained in article 5 has already been considered. This section deals with the publication of closing lines, straight baselines and archipelagic baselines. Coastal and archipelagic States are required by the Convention to give due publicity to those baselines in one of the specified forms and to deposit a copy of that information with the Secretary-General of the United Nations.

95. Coastal States have several ways in which they may publicize the location of closing lines or straight baselines, the outer limits of roadsteads, and the delimitation of international boundaries. First the baselines drawn under articles 7, 9 and 10 and the outer limits of territorial seas related to articles 12 and 15 may be drawn on charts with an adequate scale for determining their position. The second choice involves showing the outer limits of territorial seas derived from the baselines drawn under articles 7, 9 and 10, as well as the outer limits of territorial seas related to articles 12 and 15, and from the application of the articles dealing with roadsteads and the delimitation of international boundaries on charts with an adequate scale for determining the position of those limits. The other choice is to list the geographical co-ordinates of the points defining these baselines or limits instead of showing them on charts.

96. Archipelagic States have a similar option of showing baselines on a chart or by a list of co-ordinates. Those archipelagic States which create internal waters under the terms of article 50 must also publicize the relevant baselines in terms of article 16.

97. If lists of co-ordinates are provided, then a geodetic datum[25] must be provided so that the basis on which the co-ordinates were determined is not in doubt. Such lists are only a substitute for the chart where the co-ordinates are linked by "straight" lines, or where the lines joining the co-ordinates are otherwise precisely described e.g. as arcs of circles centred on specified points. It is unusual to use lists of co-ordinates in the latter circumstances.

98. In each case where it is required that publicity be given to baselines or limits, a choice is permitted between use of a chart or a list of geographical co-ordinates. Of these two, charts provide an immediate visual presentation of the information, but the largest practicable scale cannot provide the same precision as a list of geographical co-ordinates. Co-ordinates can be listed to any required degree of precision, although it is usual to give positions to the nearest second of arc (1″), which represents about 30 metres in latitude and generally less in longitude. It may often be found convenient to use both: the chart for illustrative purposes, and a list to provide the definitive positions. In giving publicity in such cases it may be found convenient to list the co-ordinates on the chart.

99. If a list of co-ordinates linked by "straight" lines is used, uncertainties may arise unless the true nature of the lines linking the individual positions is described. (This is addressed at (vii) of document A/CONF.62/L.76 (annex II below.)) If the baselines are shown only on a chart, and any straight lines are not otherwise defined, it will generally be assumed that they are straight in relation to the chart projection used.

100. A State that does not publish its own nautical charts, but wishes to publish its baselines or limits by means of charts, has two choices. It may decide to use the charts published by the primary charting authority, or it may prefer to prepare special charts of its own specifically

for this purpose. In the latter case, the guidelines set out in chapter I will apply, but in order to show the full extent of an exclusive economic zone, for example, smaller scales than those previously recommended may be necessary. It may be found convenient to produce different charts on a larger scale to show the less extensive limits or the baselines. Regard must be given, however, to the requirements of enforcement and the remarks at (iv) of annex II. If charts are to be relied upon for enforcement purposes it may not be possible to depict more than a part of the exclusive economic zone limit on any one chart of a suitable scale.

101. If the charts of the primary charting authority are selected it will generally be necessary to obtain the consent of the charting authority. Such requests are usually treated generously. The charting authority may require a disclaimer to be printed on the charts to the effect that the baselines or limits are not its responsibility.

102. Finally, under the Convention, States have an obligation to deposit charts and lists of geographical co-ordinates of their baselines with the Secretary-General of the United Nations.

NOTES

[1] Report of the Group of Experts on Hydrographic Surveying and Nautical Charting, 12 May 1978. UNESCO document E/CONF/71/L.1.

[2] Resolutions of the International Hydrographic Organization, Technical Resolution A 2.5 (3). Datum and Benchmarks, Miscellaneous Publication MP-003.

[3] Shepard, Francis P., *Submarine Geology* (New York, Harper and Row, 1963), p. 358.

[4] This is a hypothetical case because the Louisiade Archipelago forms part of the archipelagic State of Papua New Guinea, and is enclosed by archipelagic baselines (PNG Act No. 7 of 1977, Schedule Z).

[5] In the United States Supreme Court case United States v. Louisiana (1969), the Supreme Court took a contrary view and ruled that, in relation to the 1958 Convention, which is identical to the 1982 Convention in this regard, a bay closing line should be considered as part of the coastline so far as the application of the article is concerned.

[6] Fisheries Case, Judgment of 18 December 1951, *I.C.J. Reports 1951*, pp. 116 and 128.

[7] Several writers have suggested criteria for application of this article: Hodgson and Alexander, "Towards an objective analysis of special circumstances", *Law of the Sea Institute*, Special Paper No. 13 (1972); Beazley, "Maritime limits and baselines", *Hydrographic Society*, Special Publication No. 2 (3rd edition, 1988); U.S. Department of State, "Developing standard guidelines for evaluating straight baselines", *Limits in the Seas*, No. 106 (1987).

[8] United States Department of State, "Developing standard guidelines for evaluating straight baselines", *Limits in the Seas*, No. 106, p. 22.

[9] This paragraph was conceived as part of paragraph 1, and appeared in that form in the Informal Single Negotiating Text. It appeared as a separate paragraph in the Revised Single Negotiating Text, without severing its link with paragraph 1. It does postulate a set of circumstances distinct from those set out in paragraph 1, but provides for a particular application of them.

[10] Paragraph 1 does not specify whether the appropriate points should lie on the charted low-water line but common sense, the wording of paragraph 2, which specifies "low-water line", and State practice all reinforce the view that the basepoints would normally lie on the charted low-water line rather than further inland.

[11] Where a fringe of islands extends across the boundary between two adjacent States, there are examples in State practice (e.g. Denmark, Federal Republic of Germany, Finland, Norway and Sweden) of one coastal State extending its system of straight baselines up to the territorial sea boundary with the adjacent State, determining the direction of the last segment of baseline on the location of some part of the fringe lying just beyond the boundary and so not in its own territory. In such cases the closure of internal waters is presumably effected by the territorial sea boundary between the States.

[12] *I.C.J. Reports 1951*, p. 116.

[13] *Limits in the Seas*, No. 106, p. 19.

[14] There is no specified maximum length of baseline that may be drawn under the provisions of article 7. For discussion with respect to the maximum length of such baselines, see *Limits in the Seas*, No. 106, p. 31.

[15] *Yearbook of the International Law Commission*, 1955, vol. II, p. 54.

[16] Document A/3159, Report of the International Law Commission covering the work of its eighth session, 23 April-4 July 1956. Also issued as *Official Records of the General Assembly, Eleventh Session, Supplement No. 9*.

[17] See Beazley, "Maritime limits and baselines", *Hydrographic Society*, Special Publication No. 2 (3rd edition, 1988); Bouchez, *The Régime of Bays in International Law* (The Hague, 1963); Hodgson and Alexander, "Towards an objective analysis of special circumstances", *Law of the Sea Institute*, Special Paper No. 13 (1972); Kapoor and Kerr, *A Guide to Maritime Boundary Delimitation* (Carswell, 1986); Strohl, *The International Law of Bays* (Martinus Nijhoff, 1963).

[18] See United States v. California, 381 U.S. (1965); U.S. v. Louisiana, 394 U.S. (1969); U.S. v. Louisiana et al., No. 9 (1974) (original); U.S. v. Maine et al. (Rhode Island, New York), No. 35 (1983) (original).

[19] New Zealand has seemingly relied on the area of the tidal Onoke Lake in order to enclose Palliser Bay as a juridical bay.

[20] In the United States Supreme Court case U.S. v. Maine et al. (1985), it was claimed that the configuration of Long Island and the very narrow channel separating its western end from the mainland were such that it could be considered part of the mainland so that Long Island Sound is a juridical bay.

[21] This was based on an informal proposal by the Bahamas.

[22] It is worth noting, however, that the definition is a perfectly valid description of certain types of atoll, and similar tests could apply.

[23] Fiji has not included either Rotuma or Ceva-i-Ra within its archipelagic baselines. They both lie about 250 nautical miles from the main archipelago. The method of straight baselines has been employed around part of Rotuma. Fiji Marine Spaces (Archipelagic Baselines and Exclusive Economic Zone) Order, 1981, and Marine Spaces (Territorial Seas) (Rotuma and its Dependencies) Order, 1981.

[24] Solomon Islands have declared five separate archipelagos. Four islands are not enclosed within any of the archipelagic baseline systems. Solomon Islands, The Delimitation of Marine Waters Act (No. 32 of 1978).

[25] See technical comment (vi) in document A/CONF.62/L.76 (annex II below).

Annex I

STANDARD LOW-WATER LEVELS

The following low-water levels are widely used as chart datums.

(a) *Lowest astronomical tide* (LAT). The lowest level which can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions; this level will not be reached every year. LAT is not the lowest level that can be reached, as storm surges may cause considerably lower levels to occur.

(b) *Mean low-water springs* (MLWS). The height of mean low-water springs is the average, throughout a year when the average maximum declination of the moon is 23 1/2 degrees, of the heights of two successive low waters during those periods of 24 hours (approximately once a fortnight) when the range of the tide is greatest.

(c) *Mean lower low water* (MLLW). The height of mean lower low water is the mean of the lower of the two daily low waters over a long period of time. When only one low water occurs on a day this is taken as the lower low water.

Where the range of the tide is negligible the level of chart datum may be based on:

(d) *Mean sea-level* (MSL). Mean sea-level is the average level of the sea surface over a long period, preferably 18.6 years, or the average level which would exist in the absence of tides.

The above definitions have been adapted from the British Admiralty Tide Tables.

Annex II

EXTRACT FROM DOCUMENT A/CONF.62/L.76 OF 18 AUGUST 1981

STUDY ON THE FUTURE FUNCTIONS OF THE SECRETARY-GENERAL UNDER THE DRAFT CONVENTION AND ON THE NEEDS OF COUNTRIES, ESPECIALLY DEVELOPING COUNTRIES, FOR INFORMATION, ADVICE AND ASSISTANCE UNDER THE NEW LEGAL RÉGIME

7. *Some scientific and technical aspects*

Hydrographic surveying and charting for the purposes of navigational safety and the establishment of jurisdiction

(*a*) Preparation of nautical charts showing low-water lines, water depths, islands and rocks, etc., bottom elevations such as reefs, low-tide elevations, navigable channels, sea lanes and traffic separation schemes, aids to navigation and other information for mariners, such as hazards, safety zones around installations, etc. Correction of charts and navigational information as required. Publication and circulation.

(*b*) Preparation of lists of geographic co-ordinates, with the geodetic datum, for formal definition of areas. Questions of overprinting such lists on nautical charts, or producing special charts to show baselines (particularly where straight baselines (article 7) or where a combination of methods are used (article 14) and where archipelagic baselines (article 47) are used). Questions concerning scale of charts and determination of the geodetic datum.

(*c*) Determination of the features of the continental margin for purposes of establishing limits of continental shelf (article 76) and implementing jurisdiction over continental shelf.

(*d*) Establishment of navigational and hydrographical characteristics of territorial sea, straits and other areas requiring more detailed investigation.

Technical comments

(i) Low-water line (article 5) is normally shown as an identifiable feature on nautical charts unless the scale is too small to distinguish it from the high-water line (coastline) or where there is no tide. Thus a special "baseline" chart depicting the "normal baseline" is not necessary where a suitable nautical chart already exists. The actual water level taken as low-water for charting purposes is known as the level of chart datum, for which there is no universally agreed definition. However, a technical resolution of the International Hydrographic Conference states that it shall be a plane so low that the tide will not frequently fall below it. In practice, this will be very close to the lowest tide level.

(ii) Large-scale charts (article 5). Since the scale of a chart is an expression of the relationship between a distance measured on the earth's surface and the length that represents it on the chart, a chart of scale 1/50,000 is of larger scale than a chart of scale 1/100,000. The larger scales allow

greater detail and are more usually kept up-to-date for small changes than the smaller scales. Nevertheless, it may not always be convenient or necessary to refer to the largest scale for adequate details of the low-water line. Because of the wide variety of scales employed depending on navigational needs and the detail with which an area has been surveyed, it is not possible to state what may be the smallest scale. Where circumstances permit, the range may lie between 1/50,000 and 1/200,000.

(iii) Depiction of a line (articles 16, 75 and 84). It is possible to define a limit with far greater precision by reference to geographic co-ordinates although such precision may not be necessary; neither need such a list be at all a convenient method of defining a sinuous line or a complex line. In fact, a list of co-ordinates and charts may both be used—perhaps the first for formal definition and the second for illustrative convenience. In such circumstances, it would be necessary to make clear which is the definitive document and which merely illustrative.

(iv) Scales (articles 16, 75 and 84). The requirement is that the scale of the charts on which the coastal State depicts its limits or boundaries should be adequate for the user to determine them to the same degree of accuracy as the coastal State intends. For instance, a limit depicted on a chart of scale 1/500,000 by a line 0.3 mm thick will represent a line on the sea's surface nearly 1/10 of an international nautical mile (185 metres) in width. Also, the accuracy with which a vessel may be able to determine its position depends on its equipment, weather conditions, distance from land, etc. Many fishing vessels working 200 miles from land would be unable to determine their position better than to within 5 nautical miles.

(v) Charts. The lines or limits required under articles 16, 75 and 84 are features not necessarily shown on the ordinary nautical chart which is specifically designed to meet the requirements of marine navigation. Thus a choice will arise between using nautical charts or relying on lists of co-ordinates (or using the latter supplemented by the former), and if charts are used there will be a choice of overprinting the lines on all copies of the standard navigational chart, or of making a separate overprinted edition or of producing a special chart solely to show baselines.

(vi) Geodetic datums (articles 16, 75, 76(9) and 84). Astronomical observations have been used traditionally to determine the latitude and longitude of a place, so that the apparent relationship between different positions is largely dependent on variations in gravitational force, which while slight are significant. Thus, the true distance between two astronomically determined positions may not be the same as the distance calculated from their apparent longitudinal and latitudinal differences. In an oceanic area where the positions of islands or groups of islands, separated by large distances, will have been found independently by astronomical means, each island or group will be on a different "geodetic datum". Neighbouring continental States, similarly mapped according to a nationally established, astronomically determined "origin", can find that the locations of particular places do not agree when their latitudes and longitudes are compared. Even though the means now exist to reconcile these differences, it is seldom worth the expense to do so for normal

purposes since it might involve a complete recomputation and redrawing of all a country's maps, which are perfectly suitable for most purposes.

Nonetheless, the practical effect of these differences is that the exact location of a maritime boundary in relation to coastal States cannot be determined unless the positions from which it is derived are first determined on or transformed to a single geodetic datum. In some areas a common datum exists (e.g., European datum) to which positions on individual national datums may easily be transformed. The introduction of satellite position fixing methods allows the geographical position of any chosen site to be determined on a single global geodetic datum. By using this it is possible to determine transformation data to convert existing "national" positions on to a common datum, suitable even for use in oceanic areas where more traditional observed trigonometrical links cannot be made.

Because of the differences between datums it is important that the datum used to quote geographical positions on maritime limits or boundaries should be stated, especially as very accurate positions can now be determined far from land by means of satellite positioning equipment. In reality, the subject is more complex than has been described here. The above explanation is only intended to give an idea of the technical problems involved in maritime delineation.

(vii) Straight lines (articles 7, 8, 9, 10, 15, 47, 74, 76, 83). The equivalent of a "straight line" "on the surface of the earth" would be the line of sight between two objects. In mapping terms, this is the "geodesic", the shortest distance between two points on an ellipsoid (or on any regular surface). An equidistance line generated by two basepoints is very nearly the same as a geodesic. The geodesic appears practically as a straight line on certain types of map projection, but in the Mercator projection (widely used for nautical charts) the geodesic is a curved line except where it runs along the Equator or due north and south. The straight line on the Mercator chart is called a loxodrome (or rhumb line). The difference between the loxodrome and the geodesic joining two points can be very considerable, particularly in high latitudes, and if the lines are long the difference in area involved by using the different types of line may be very significant.

The precise nature of what a "straight line" should be is generally of less importance than that its nature be agreed between States when boundaries are determined, and that it be specified by States claiming straight baselines of a length that would make differences significant.

Appendix I

CONSOLIDATED GLOSSARY OF TECHNICAL TERMS USED IN THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA

Introduction

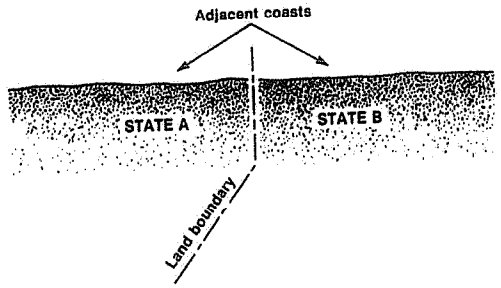
The 1982 United Nations Convention on the Law of the Sea includes terms of a technical nature that may not always be readily understood by those seeking general information or those called upon to assist in putting the Convention articles into effect. Such readers could vary from politicians and lawyers to hydrographers, land surveyors, cartographers and other geographers. The need to understand such terms may become of particular concern to those involved in maritime boundary delimitation. Accordingly, the Technical Aspects of the Law of the Sea Working Group of the International Hydrographic Organization has endeavoured to produce this glossary to assist all readers of the Convention in understanding the hydrographic, cartographic and oceanographic terms used.

Where definitions have been extracted verbatim from the Convention or where the Working Group has defined the terms itself, they will appear in bold type in the glossary. Explanatory notes appear beneath these in lighter type. Where appropriate, reference is made to the articles of the Convention.

Index of glossary terms

1 ***Adjacent coasts***

The coasts lying either side of the land boundary between two adjoining States.



2 ***Aid to navigation***

Visual, acoustical or radio device external to a craft designed to assist in the determination of a safe course or of a vessel's position, or to warn of dangers and obstructions.

See: Navigational aid.

3 ***Archipelagic baselines***

See: Baseline.

4 ***Archipelagic sea lane***

As defined in article 53.

See: Routeing system; traffic separation scheme.

5 ***Archipelagic State***

As defined in article 46.

See: Archipelagic waters; baseline; islands.

6 ***Archipelagic waters***

The waters enclosed by archipelagic baselines.

See: Articles 46, 47 and 49.

See: Archipelagic State; baseline; internal waters.

7 ***Area***

As defined in article 1.1.(1).

See: Baseline; continental shelf; deep ocean floor; exclusive economic zone; sea-bed; subsoil.

8 ***Artificial island***

See: Installation (off-shore).

9 ***Atoll***

A ring-shaped reef with or without an island situated on it surrounded by the open sea, that encloses or nearly encloses a lagoon.

Where islands are situated on atolls the territorial sea baseline is the seaward low-water line of the reef as shown by the appropriate symbol on charts officially recognized by the coastal State (article 6).

For the purpose of computing the ratio of water to land when establishing archipelagic waters, atolls and the waters contained within them may be included as part of the land area (article 47.7).

See: Archipelagic waters; baseline; islands; low-water line; reef.

10 ***Bank***

An elevation of the sea floor located on a continental (or an island) shelf, over which the depth of water is relatively shallow.

A shallow area of shifting sand, gravel, mud, etc. as a sand bank, mud bank, etc. usually constituting a danger to navigation and occurring in relatively shallow waters.

See: Continental shelf.

11 ***Baseline***

The line from which the seaward limits of a State's territorial sea and certain other maritime zones of jurisdiction are measured.

The term usually refers to the baseline from which to measure the breadth of the territorial sea; the seaward limits of the contiguous zone (article 33.2), the exclusive economic zone (article 57) and, in some cases, the continental shelf (article 76) are measured from the same baseline.

See: Internal waters.

The territorial sea baseline may be of various types depending on the geographical configuration of the locality:

The "normal baseline" is the low-water line along the coast (including the

coasts of islands) as marked on large-scale charts officially recognized by the coastal State (articles 5 and 121.2).

See: Low-water line.

In the case of islands situated on atolls or of islands having fringing reefs, the baseline is the seaward low-water line of the reef, as shown by the appropriate symbol on charts officially recognized by the coastal State (article 6).

Where a low-tide elevation is situated wholly or partly at a distance not exceeding the breadth of the territorial sea from the mainland or an island, the low-water line on that elevation may be used as part of the baseline (article 13).

See: Low-tide elevation.

Straight baselines are a system of straight lines joining specified or discrete points on the low-water line, usually known as straight baseline turning points, which may be used only 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 (article 7.1).

See: Straight line.

Archipelagic baselines are straight lines joining the outermost points of the outermost islands and drying reefs which may be used to enclose all or part of an archipelago forming all or part of an archipelagic State (article 47).

12 ***Basepoint***

A basepoint is any point on the baseline. In the method of straight baselines, where one straight baseline meets another baseline at a common point, one line may be said to "turn" at that point to form another baseline. Such a point may be termed a "baseline turning point" or simply "basepoint".

13 ***Bay***

For the purposes of this Convention, a bay is a well-marked indentation whose penetration is in such proportion to the width of its mouth as to contain land-locked waters and constitute more than a mere curvature of the coast. An indentation shall not, however, be regarded as a bay unless its area is as large as, or larger than, that of the semi-circle whose diameter is a line drawn across the mouth of that indentation (article 10.2).

This definition is purely legal and is applicable only in relation to the determination of the limits of maritime zones. It is distinct from and does not replace the geographical definitions used in other contexts.

This definition does not apply to "historic" bays (article 10.6).

See: Historic bays.

14 ***Cap***

Feature with a rounded cap-like top. Also defined as a plateau or flat area of considerable extent, dropping off abruptly on one or more sides.

15 ***Chart***

A nautical chart specially designed to meet the needs of marine navigation. It depicts such information as depths of water, nature of the sea-bed, configuration and nature of the coast, dangers and aids to navigation, in a standardized format; also called simply "chart".

See: Baseline; coast; danger to navigation; geodetic datum; low-water line; navigation aid; sea-bed; tide.

16 *Closing line*

A line that divides the internal waters and territorial seas of a coastal State or the archipelagic waters of an archipelagic State. It is most often used in the context of establishing the baseline at the entrance to rivers (article 9), bays (article 10), and harbours (article 11).

See: Archipelagic State; baseline; bay; harbour works; internal waters; low-water line.

17 *Coast*

The sea-shore. The narrow strip of land in immediate contact with any body of water, including the area between high- and low-water lines.

See: Baseline; low-water line.

18 *Contiguous zone*

1. In a zone contiguous to its territorial sea, described as the contiguous zone, the coastal State may exercise the control necessary to:

(*a*) Prevent infringement of its customs, fiscal, immigration or sanitary laws and regulations within its territory or territorial sea;

(*b*) Punish infringement of the above laws and regulations committed within its territory or territorial sea.

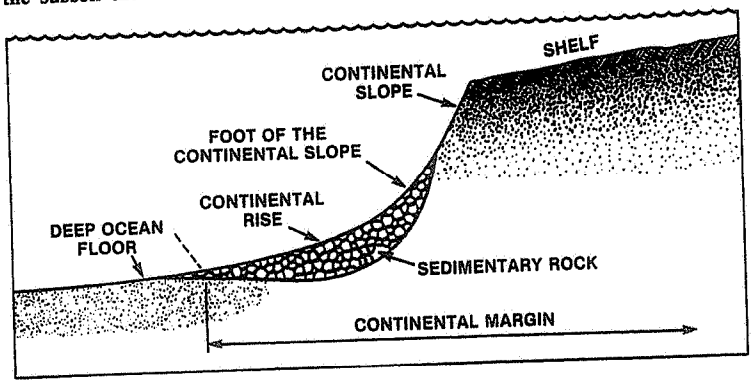
2. The contiguous zone may not extend beyond 24 nautical miles from the baselines from which the breadth of the territorial sea is measured (article 33).

See: Baseline; exclusive economic zone; high seas.

19 *Continental margin*

As defined in article 76.3, as follows:

"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 with its oceanic ridges or the subsoil thereof."



See: Continental rise; continental shelf; continental slope; foot of the continental slope; deep ocean floor; sea-bed; subsoil.

20 *Continental rise*

A submarine feature which is that part of the continental margin lying between the continental slope and the abyssal plain.

It is usually a gentle slope with gradients of 1/2 degree or less and a generally smooth surface consisting of sediments.

See: Continental margin; continental slope; deep ocean floor; foot of the continental slope.

21 *Continental shelf*

As defined in article 76.1, as follows:

"The continental shelf of a coastal State comprises the sea-bed and subsoil of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin, or to a 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 margin does not extend up to that distance."

The limits of the continental shelf or continental margin are determined in accordance with the provisions of article 76 of the Convention. If the continental margin extends beyond a 200 nautical mile limit measured from the appropriate baselines the provisions of article 76.4 to 76.10 apply.

See: Continental margin, outer limit.

22 *Continental slope*

That part of the continental margin that lies between the shelf and the rise. Simply called the slope in article 76.3.

The slope may not be uniform or abrupt, and may locally take the form of terraces. The gradients are usually greater than 1.5°.

See: Continental margin; continental shelf; continental rise; deep ocean floor; foot of the continental slope.

23 *Danger to navigation*

A hydrographic feature or environmental condition that might operate against the safety of navigation.

24 *Deep ocean floor*

The surface lying at the bottom of the deep ocean with its oceanic ridges, beyond the continental margin.

The continental margin does not include the deep ocean floor with its oceanic ridges or the subsoil thereof.

See: Continental margin; oceanic ridge; sea-bed; submarine ridge; subsoil.

25 *Delimitation*

See: Line of delimitation.

26 *Delta*

A tract of alluvial land enclosed and traversed by the diverging mouths of a river.

In localities where the method of straight baselines is appropriate, and where because of the presence of a delta and other natural conditions the coastline is highly unstable, appropriate basepoints may be selected along the furthest seaward extent of the low-water line and, notwithstanding subsequent regression of the low-water line, the straight baselines shall remain effective until changed by the coastal State in accordance with the Convention (article 7.2).

See: Baseline; low-water line.

27 *Due publicity*

Notification of a given action for general information through appropriate authorities within a reasonable amount of time in a suitable manner.

Under the provisions of the Convention, States shall give due publicity, *inter alia*, to charts or lists of geographical co-ordinates defining the baselines and some limits and boundaries (articles 16.2, 47.9, 75.2 and 84.2), to laws and regulations pertaining to innocent passage (article 21.3), and to sea lanes and traffic separation schemes established in the territorial sea (article 22.4) and archipelagic waters (article 53.10).

In addition to notification to concerned States through diplomatic channels, more immediate dissemination to mariners may be achieved by passing the information directly to national Hydrographic Offices for inclusion in their Notices to Mariners.

See: Baseline; chart; geographical co-ordinates; traffic separation scheme.

28 *Enclosed sea*

As defined in article 122, as follows:

"For the purposes of this Convention, 'enclosed or semi-enclosed sea' means a gulf, basin, or sea surrounded by two or more States and connected to another sea or the ocean by a narrow outlet or consisting entirely or primarily of the territorial seas and exclusive economic zones of two or more coastal States."

29 *Equidistance line*

See: Median line.

30 *Estuary*

The tidal mouth of a river, where the tide meets the current of fresh water.

See: Bay; river; delta.

31 *Exclusive economic zone (EEZ)*

As defined in article 55.

The zone may not be extended beyond 200 nautical miles from the territorial sea baselines (article 57).

The rights and jurisdictions of a coastal State in the EEZ are detailed in article 56. Other aspects of the EEZ are to be found in Part V of the Convention.

32 *Facility (navigational)*

See: Aid to navigation.

33 *Facility (port)*

See: Harbour works.

34 *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" (article 76.4 (*b*)).

It is the point where the continental slope meets the continental rise or, if there is no rise, the deep ocean floor.

To determine the maximum change of gradient requires adequate bathymetry covering the slope and a reasonable extent of the rise, from which a series of profiles may be drawn and the point of maximum change of gradient located.

The two methods laid down in article 76.4 for determining the outer limit of the continental shelf depend upon the foot of the continental slope.

See: Continental rise; continental shelf; continental slope.

35 *Geodetic data*

Information concerning points established by a geodetic survey, such as descriptions for recovery, co-ordinate values, height above sea-level and orientation.

See: Geodetic datum.

36 *Geodetic datum*

A datum defines the basis of a co-ordinate system. A local or regional geodetic datum is normally referred to an origin whose co-ordinates are defined. The datum is associated with a specific reference ellipsoid which best fits the surface (geoid) of the area of interest. A global geodetic datum is now related to the centre of the earth's mass, and its associated spheroid is a best fit to the known size and shape of the whole earth.

The geodetic datum is also known as the horizontal datum or horizontal reference datum.

The position of a point common to two different surveys executed on different geodetic datums will be assigned two different sets of geographical co-ordinates. It is important, therefore, to know what geodetic datum has been used when a position is defined.

The geodetic datum must be specified when lists of geographical co-ordinates are used to define the baselines and the limits of some zones of jurisdiction (articles 16.1, 47.8, 75.1 and 84.1).

See: Baseline; geographical co-ordinates; geodetic data.

37 *Geographical co-ordinates*

Units of latitude and longitude which define the position of a point on the earth's surface with respect to the ellipsoid of reference.

Latitude is expressed in degrees(°), minutes(′) and seconds (″) or decimals of a minute, from 0° to 90° north or south of the equator. Lines or circles joining points of equal latitude are known as "parallels of latitude" (or just "parallels").

Longitude is expressed in degrees, minutes and seconds or decimals of a

minute from 0° to 180° east or west of the Greenwich meridian. Lines joining points of equal longitude are known as "meridians".

Examples: 47° 20′ 16″ N, 20° 18′ 24″ E, or 47° 20.27′ N, 20° 18.4′ E

See: Geodetic datum.

38 ***Harbour works***

Permanent man-made structures built along the coast which form an integral part of the harbour system such as jetties, moles, quays or other port facilities, coastal terminals, wharves, breakwaters, sea walls, etc. (article 11).

Such harbour works may be used as part of the baseline for the purposes of delimiting the territorial sea and other maritime zones.

See: Baseline; port.

39 ***Historic bay***

See article 10.6. This term has not been defined in the Convention. Historic bays are those over which the coastal State has publicly claimed and exercised jurisdiction and this jurisdiction has been accepted by other States. Historic bays need not meet the requirements prescribed in the definition of "bay" contained in article 10.2.

40 ***Hydrographic survey***

The science of measuring and depicting those parameters necessary to describe the precise nature and configuration of the sea-bed and coastal strip, its geographical relationship to the land-mass, and the characteristics and dynamics of the sea.

Hydrographic surveys may be necessary to determine the features that constitute baselines or basepoints and their geographical positions.

During innocent passage, transit passage, and archipelagic sea lane passage, foreign ships, including marine scientific research and hydrographic survey ships, may not carry out any research or survey activities without the prior authorization of the coastal States (articles 19.2 (*j*), 40 and 54).

See: Baseline; geographical co-ordinates.

41 ***Installation (off-shore)***

Man-made structure in the territorial sea, exclusive economic zone or on the continental shelf usually for the exploration or exploitation of marine resources. They may also be built for other purposes such as marine scientific research, tide observations, etc.

Off-shore installations or artificial islands shall not be considered as permanent harbour works (article 11), and therefore may not be used as part of the baseline from which to measure the breadth of the territorial sea.

Where States may establish straight baselines or archipelagic baselines, low-tide elevations having lighthouses or similar installations may be used as basepoints (articles 7.4 and 47.4).

Artificial islands, installations and structures do not possess the status of islands. They have no territorial sea of their own, and their presence does not affect the delimitation of the territorial sea, the exclusive economic zone or the continental shelf (article 60.8).

Article 60 provides, *inter alia*, for due notice to be given for the construction or removal of installations, and permanent means for giving warning of their presence must be maintained. Safety zones, not to exceed 500 metres, measured from their outer edges, may be established. Any installations abandoned or disused shall be removed, taking into account generally accepted international standards.

42 ***Internal waters***

As defined in article 8.1; the relevant straits régime applies in a strait enclosed by straight baselines (article 35 (*a*)).

A State exercises complete sovereignty over its internal waters with the exception that a right of innocent passage exists for foreign vessels in areas that had not been considered as internal waters prior to the establishment of a system of straight baselines (article 8.2).

See: Baseline; bay; coastline; low-water line; historic bay; installations (off-shore); river.

43 ***Islands***

As defined in article 121.1.

Maritime zones of islands are referred to in article 121.2.

See: Atoll; baseline; contiguous zone; continental margin; exclusive economic zone; rock; tide.

44 ***Isobath***

A line representing the horizontal contour of the sea-bed at a given depth.

See: article 76.5.

45 ***Land territory***

A general term in the Convention that refers to both insular and continental land masses that are above water at high tide (articles 2.1 and 76.1).

See: Tide.

46 ***Latitude***

See: Geographical co-ordinates.

47 ***Line of delimitation***

A line drawn on a map or chart depicting the separation of any type of maritime jurisdiction.

A line of delimitation may result either from unilateral action or from bilateral agreement and, in some cases, the State(s) concerned may be required to give due publicity.

See: Due publicity.

The term "maritime boundary" may sometimes be used to describe various lines of delimitation.

See: Baseline; chart; coast; continental margin; geographical co-ordinates; exclusive economic zone; median line; opposite coasts; outer limit; territorial sea.

48 *Longitude*

See: Geographical co-ordinates.

49 *Low-tide elevation*

A low-tide elevation is a naturally formed area of land which is surrounded by and above water at low tide but submerged at high tide (article 13.1).

Low-tide elevation is a legal term for what are generally described as drying banks or rocks. On nautical charts they should be distinguishable from islands.

Where a low-tide elevation is situated wholly or partly at a distance not exceeding the breadth of the territorial sea from the mainland or an island, the low-water line on that elevation may be used as the baseline for measuring the territorial sea (article 13.1).

Articles 7.4 and 47.4 refer to the use of low-tide elevations as basepoints in a system of straight baselines or archipelagic baselines.

See: Baseline; island; low-water line; chart; territorial sea; installation (off-shore).

50 *Low-water line/low-water mark*

The intersection of the plane of low water with the shore. The line along a coast, or beach, to which the sea recedes at low water.

It is the normal practice for the low-water line to be shown as an identifiable feature on nautical charts unless the scale is too small to distinguish it from the high-water line or where there is no tide so that the high- and low-water lines are the same.

The actual water level taken as low-water for charting purposes is known as the level of chart datum (document A/CONF.62/L76).

See: Baseline; chart; tide.

51 *Median line/equidistance line*

A line every point of which is equidistant from the nearest points on the baselines of two or more States between which it lies.

See: Adjacent coasts; baseline; opposite coasts; territorial sea.

52 *Mile*

See: Nautical mile.

53 *Mouth (bay)*

Is the entrance to the bay from the ocean.

Article 10.2 states "a bay is a well-marked indentation", and the mouth of that bay is "the mouth of that indentation". Articles 10.3, 10.4 and 10.5 refer to "natural entrance points of a bay". Thus it can be said that the mouth of a bay lies between its natural entrance points.

In other words, the mouth of a bay is its entrance.

Although some States have developed standards by which to determine natural entrance points to bays, no international standards have been established.

See: Baseline; bay; closing line; estuary; low-water line.

54 *Mouth (river)*

The place of discharge of a stream into the ocean.

If a river flows directly into the sea, the baseline shall be a straight line across the mouth of the river between points on the low-water line of its banks (article 9). Note that the French text of the Convention is "Si un fleuve se jette dans la mer sans former d'estuaire. . ." (underlining added).

No limit is placed on the length of the line to be drawn.

The fact that the river must flow "directly into the sea" suggests that the mouth should be well marked, but otherwise the comments on the mouth of a bay apply equally to the mouth of a river.

See: Baseline; closing line; estuary; low-water line; river.

55 *Nautical chart*

See: Chart.

56 *Nautical mile*

A unit of distance equal to 1,852 metres.

This value was adopted by the International Hydrographic Conference in 1929 and has subsequently been adopted by the International Bureau of Weights and Measures. The length of the nautical mile is very close to the mean value of the length of 1′ of latitude, which varies from approximately 1,843 metres at the equator to 1,861 2/3 metres at the pole.

See: Geographical co-ordinates.

57 *Navigational aid*

See: Aid to navigation.

58 *Navigational chart*

See: Aid to navigation.

59 *Oceanic plateau*

A comparatively flat-topped elevation of the sea-bed which rises steeply from the ocean floor on all sides and is of considerable extent across the summit.

For the purpose of computing the ratio of water to land enclosed within archipelagic baselines, land areas may, *inter alia*, include waters lying within that part of a steep-sided oceanic plateau which is enclosed or nearly enclosed by a chain of limestone islands and drying reefs lying on its perimeter (article 47.7).

See: Archipelagic State; baseline.

60 *Oceanic ridge*

A long elevation of the ocean floor with either irregular or smooth topography and steep sides.

Such ridges are excluded from the continental margin (article 76.3).

See: Deep ocean floor.

61 *Opposite coasts*

The geographical relationship of the coasts of two States facing each other.

Maritime zones of States having opposite coasts may require boundary delimitation to avoid overlap.

62 *Outer limit*

The extent to which a coastal State claims or may claim a specific jurisdiction in accordance with the provisions of the Convention.

In the case of the territorial sea, the contiguous zone and the exclusive economic zone, the outer limits lie at a distance from the nearest point of the territorial sea baseline equal to the breadth of the zone of jurisdiction being measured (articles 4, 33.2 and 57).

In the case of the continental shelf, where the continental margin extends beyond 200 nautical miles from the baseline from which the territorial sea is measured, the extent of the outer limit is described in detail in article 76.

See: Baseline; contiguous zone; continental margin; continental shelf; exclusive economic zone; isobath; territorial sea.

63 *Parallel of latitude*

See: Geographical co-ordinates.

64 *Platform*

See: Installation (off-shore).

65 *Port*

A place provided with various installations, terminals and facilities for loading and discharging cargo or passengers.

66 *Reef*

A mass of rock or coral which either reaches close to the sea surface or is exposed at low tide.

Drying reef. That part of a reef which is above water at low tide but submerged at high tide.

Fringing reef. A reef attached directly to the shore or continental land mass, or located in their immediate vicinity.

In the case of islands situated on atolls or of islands having fringing reefs, the baseline . . . is the seaward low-water line of the reef, as shown by the appropriate symbol on charts officially recognized by the coastal State (article 6).

See: Atoll; baseline; island; low-water line.

67 *Rise*

See: Continental rise.

68 *River*

A relatively large natural stream of water.

69 *Roadstead*

An area near the shore where vessels are intended to anchor in a position of safety; often situated in a shallow indentation of the coast.

"Roadsteads which are normally used for loading, unloading and anchoring of

ships, and which would otherwise be situated wholly or partly outside the outer limit of the territorial sea, are included in the territorial sea" (article 12).

In most cases roadsteads are not clearly delimited by natural geographical limits, and the general location is indicated by the position of its geographical name on charts. If article 12 applies, however, the limits must be shown on charts or must be described by a list of geographical co-ordinates.

See: Line of delimitation; chart; geographical co-ordinates; territorial sea.

70 *Rock*

A solid mass of limited extent.

There is no definition given in the Convention. It is used in article 121.3, which states:

"Rocks which cannot sustain human habitation or economic life of their own shall have no exclusive economic zone or continental shelf."

See: Island; low-tide elevation.

71 *Routeing system*

Any system of one or more routes and/or routeing measures aimed at reducing the risk of casualties; it includes traffic separation schemes, two-way routes, recommended tracks, areas to be avoided, inshore traffic zones, roundabouts, precautionary areas and deep-water routes.

72 *Safety aids*

See: Aid to navigation.

73 *Safety zone*

Zone established by the coastal State around artificial islands, installations and structures in which appropriate measures to ensure the safety both of navigation and of the artificial islands, installations and structures are taken. Such zones shall not exceed a distance of 500 metres around them, except as authorized by generally accepted international standards or as recommended by the competent international organization (articles 60.4 and 60.5).

See: Installation (off-shore).

74 *Scale*

The ratio between a distance on a chart or map and a distance between the same two points measured on the surface of the Earth (or other body of the universe).

Scale may be expressed as a fraction or as a ratio. If on a chart a true distance of 50,000 metres is represented by a length of 1 metre the scale may be expressed as 1:50,000 or as 1/50,000. The larger the divisor the smaller is the scale of the chart.

See: Chart.

75 *Sea-bed*

The top of the surface layer of sand, rock, mud or other material lying at the bottom of the sea and immediately above the subsoil.

The sea-bed may be that of the territorial sea (article 2.2), archipelagic waters (article 49.2), the exclusive economic zone (article 56), the continental shelf

(article 76), the high seas (article 112.1) or the area (articles 1.1.(1) and 133). It may be noted, however, that in reference to the surface layer seaward of the continental rise, article 76 uses the term "deep ocean floor" rather than "sea-bed."

See: Area; continental shelf; deep ocean floor; exclusive economic zone; subsoil.

76 *Sedimentary rock*

Rock formed by the consolidation of loose sediments that have accumulated in layers in water or in the atmosphere. (The term sedimentary rock is used in article 76.4.(*a*)(i).)

The sediments may consist of rock fragments or particles of various sizes (conglomerate, sandstone, shale), the remains or products of animals or plants (certain limestones and coal), the product of chemical action or of evaporation (salt, gypsum, etc.) or a mixture of these materials.

77 *Semi-enclosed sea*

See: Enclosed sea (article 122).

78 *Shelf*

Geologically an area adjacent to a continent or around an island and extending from the low-water line to the depth at which there is usually a marked increase of slope to greater depth.

See: Continental shelf.

79 *Size of area*

The general requirements are laid down in annex III, articles 8 and 17.2 (*a*) of the Convention. The first of these articles requires that the applicant shall indicate the co-ordinates dividing the area.

The most common system of co-ordinates is that of latitude and longitude, although rectangular co-ordinates on the Universal Transverse Mercator Grid (quoting the appropriate zone number), Marsden Squares, Polar Grid Co-ordinates, etc. are also unambiguous. The Preparatory Commission has under consideration that applications for plans of work should define the areas by reference to the global system WGS (article 2.12 of Draft Regulations on Prospecting, Exploration and Exploitation of Polymetallic Nodules in the Area, document LOS/PCN/SCN.3/WP.6).

See: Geographical co-ordinates.

80 *Slope*

See: Continental slope

81 *Spur*

A subordinate elevation, ridge or rise projecting outward from a larger feature.

The maximum extent of the outer limit of the continental shelf along submarine ridges is 350 nautical miles from the baselines. This limitation however "does not apply to submarine elevations that are natural components of the continental margin, such as plateaux, rises, caps, banks and spurs" (article 76.6).

See: Bank; cap; continental shelf; submarine ridge.

82 *Straight baseline*

See: Baseline.

83 *Straight line*

Mathematically the line of shortest distance between two points.

See: Baseline; continental margin; continental shelf.

84 *Strait*

Geographically, a narrow passage between two land masses or islands or groups of islands connecting two larger sea areas.

Only straits "used for international navigation" are classified as "international straits", and only such straits fall within the specific régime provided in part III, sections 2 and 3, of the Convention.

85 *Structure*

See: Installation (off-shore).

86 *Submarine cable*

An insulated, waterproof wire or bundle of wires or fibre optics for carrying an electric current or a message under water.

They are laid on or in the sea-bed, and the most common are telegraph or telephone cables, but they may also be carrying high voltage electric currents for national power distribution or to off-shore islands or structures.

They are usually shown on charts if they lie in areas where they may be damaged by vessels anchoring or trawling.

All States are entitled to lay submarine cables on the continental shelf subject to the provisions of article 79.

Articles 113, 114 and 115 provide for the protection of submarine cables and indemnity for loss incurred in avoiding injury to them.

See: Submarine pipelines.

87 *Submarine pipelines*

A line of pipes for conveying water, gas, oil, etc., under water.

They are laid on or trenched into the sea-bed, and they could stand at some height above it. In areas of strong tidal streams and soft sea-bed material the sea-bed may be scoured from beneath sections of the pipe leaving them partially suspended.

They are usually shown on charts if they lie in areas where they may be damaged by vessels anchoring or trawling.

The delineation of the course for the laying of such pipelines on the continental shelf is subject to the consent of the coastal State.

Articles 113, 114 and 115 provide for the protection of submarine pipelines and indemnity for loss incurred in avoiding injury to them.

All States are entitled to lay submarine pipelines on the continental shelf subject to the provisions of article 79.

See: Submarine cables.

88 *Submarine ridge*

An elongated elevation of the sea floor, with either irregular or relatively smooth topography and steep sides, which constitutes a natural prolongation of land territory.

On submarine ridges the outer limit of the continental shelf shall not exceed 350 nautical miles from the territorial sea baselines, subject to a qualification in the case of submarine elevations which are natural components of the continental margin of a coastal State (article 76.6).

See: Continental shelf.

89 *Subsoil*

All naturally occurring matter lying beneath the sea-bed or deep ocean floor.

The subsoil includes residual deposits and minerals as well as the bedrock below.

The area and a coastal State's territorial sea, archipelagic waters, exclusive economic zone and continental shelf all include the subsoil (articles 1.1 (1), 2.2, 49.2, 56.1 (*a*) and 76.1).

See: Area; continental shelf; exclusive economic zone; sea-bed.

90 *Superjacent waters*

The waters lying immediately above the sea-bed or deep ocean floor up to the surface.

The Convention only refers to the superjacent waters over the continental shelf and those superjacent to the area in articles 78 and 135 respectively.

See: Area; continental shelf; exclusive economic zone; sea-bed; water column.

91 *Territorial sea*

A belt of water of a defined breadth but not exceeding 12 nautical miles measured seaward from the territorial sea baseline.

The coastal State's sovereignty extends to the territorial sea, its sea-bed and subsoil, and to the air space above it. This sovereignty is exercised subject to the Convention and to other rules of international law (articles 2 and 3).

The outer limit of the territorial sea is the line every point of which is at a distance from the nearest point of the baseline equal to the breadth of the territorial sea (article 4).

Article 12 provides that certain roadsteads wholly or partly outside the territorial sea are included in the territorial sea; no breadth limitation is expressed.

The major limitations on the coastal State's exercise of sovereignty in the territorial sea are provided by the rights of innocent passage for foreign ships and transit passage and archipelagic sea lanes passage for foreign ships and aircraft (part II, section 3, part III, section 2, and part IV of the Convention).

See: Archipelagic sea lanes; baseline; islands; low-tide elevations; nautical mile; roadsteads.

92 *Tide*

The periodic rise and fall of the surface of the oceans and other large bodies of water due principally to the gravitational attraction of the Moon and Sun on a rotating Earth.

Chart datum: The tidal level to which depths on a nautical chart are referred to constitutes a vertical datum called chart datum.

While there is no universally agreed chart datum level, however, under an International Hydrographic Conference Resolution (A 2.5) it "shall be a plane so low that the tide will seldom fall below it".

See: Chart; low-water line.

93 *Traffic separation scheme*

A routeing measure aimed at the separation of opposing streams of traffic by appropriate means and by the establishment of traffic lanes.

See: Routeing system.

94 *Water column*

A vertical continuum of water from sea surface to sea-bed.

See: Sea-bed; superjacent waters.

Appendix II

LIST OF PARTICIPANTS IN THE MEETING OF THE GROUP OF TECHNICAL EXPERTS ON BASELINES

31 August to 4 September 1987
New York

Rear Admiral Hussein Abbas El-Shaffie
Deputy Director
Navigation and Hydrographic Department
Alexandria
EGYPT

Commander P. B. Beazley
International Hydrographic Bureau
MONACO

Professor Werner Bettach
Head
Department of Nautical Publications
Hydrographic Survey and Cartography
Deutsches Hydrographisches Institut
Hamburg
FEDERAL REPUBLIC OF GERMANY

Commander Marco Antonio Gonçalves Bompet
Head of Geological Oceanography Section—Technical
Rio de Janeiro
BRAZIL

Sr. Luis Cabrera-Cosio
Comisionado Mexicano ante la Comision Internacional de Límites y Aguas entre México y Guatemala, Secretaría del Relaciones Exteriores
Mexico, D.F.
MEXICO

Lt. Cdr. C. M. Carleton
Territorial Waters Officer
Hydrographic Department
Ministry of Defence
London
UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND

Mr. Francis Charles
Hydrographic Unit
Port of Spain
TRINIDAD AND TOBAGO

Mr. John Cooper
Technical Adviser to the Canadian Law of the Sea Delegation
Ottawa
CANADA

Dr. A. C. Ibe
Chief Research Officer (Oceanography)
Institute of Oceanography and Marine Research
Lagos
NIGERIA

Mr. Bandama Kouadio
Institut Géographique
Abidjan
CÔTE D'IVOIRE

Mr. Liu Gongbo
Naval Engineer
The Mapping Agency of the Navigation Guarantee Department of the Chinese Navy Headquarters
Tianjin
CHINA

Mr. Gao Guixu
Engineer
Tianjin Ocean Surveying and Charting Institute
Tianjin
CHINA

Mr. Shoichi Oshima
Head
Continental Shelf Surveys Office
Maritime Safety Agency
Tokyo
JAPAN

Professor Victor Prescott
University of Melbourne
Melbourne
AUSTRALIA

M. André Roubertou
Service Hydrographique de la Marine
Paris
FRANCE

Professor Tullio Scovazzi
University of Parma
Parma
ITALY

Rear Admiral V. K. Singh
Chief Hydrographer
Naval Headquarters
New Delhi
INDIA

Dr. Robert W. Smith
Office of Ocean Law and Policy
U.S. Department of State
Washington, D.C.
UNITED STATES OF AMERICA

Mr. Adi Sumardiman
Centre for Survey and Mapping
Armed Forces
Jakarta
INDONESIA

Captain Victor N. Zakharov
Head of Department
Chief Directorate of Navigation and Oceanography
Ministry of Defence of the Union of Soviet Socialist Republics
Moscow
UNION OF SOVIET SOCIALIST REPUBLICS

Appendix III

SELECTED BIBLIOGRAPHY

Alexander, L. M. Baseline delimitations and maritime boundaries. *Virginia Journal of International Law*, 23:503-526, 1983.

Beazley, P. B. Maritime limits and baselines; a guide to their delineation. 2nd edition, revised. *The Hydrographic Society*, Special Publication No. 2. London, 1978.

Beazley, P. B. *Op. cit.* 3rd edition. London, 1988.

Brock, J. R. Archipelago concept of limits of the territorial sea. *Readings in International Law*, R. B. Lillich and J. N. Moore (eds). Newport, 1980.

Coquia, J. R. Development of the archipelagic doctrine as a recognized principle of international law. *Philippines Law Journal*, 58:143-171, 1983.

Couper, A. The Times atlas of the oceans. London, 1983.

Francalanci, G., Romano, D. and Scovazzi, T. Atlas of the straight baselines. *Studi e documenti sul diritto internazionale del mare*, (Milano) 18, 1986.

Hodgson, R. D. and Alexander, L. M. Towards an objective analysis of special circumstances. Oceans Paper 13. Rhode Island, Law of the Sea Institute, 1972.

Jagota, S. P. Maritime boundary. *Académie de droit international, Recueil des cours*, 171:81-223, 1981.

Kapoor, D. C. and Kerr, A. J. A guide to maritime boundary delimitation. Toronto, 1986.

Langeraar, W. Surveying and charting of the seas. Amsterdam, 1984.

McDorman, T. L., Beauchamp, K. P. and Johnston, D. M. Maritime boundary delimitation: an annotated bibliography, Lexington, Mass., 1983.

Nweihed, K. G. Delimitation principles and problems in the Caribbean. *Maritime issues in the Caribbean*, Jhabvola, F. (ed.). Miami:19-55, 1983.

Scovazzi, T. La linea di base del mare territoriale. *Studi e documenti sul diritto internazionale del mare*, (Milano) 17, 1986.

Shalowitz, A. L. Shore and sea boundaries. Washington, D.C., 1962. Volume 1.

Smith, R. W. A geographical primer of maritime boundary making. *Ocean Development and International Law*, 12:1-22, 1983.

Strohl, M. P. The international law of bays. The Hague, 1963.

Thamsborg, M. Geodetic hydrography as related to maritime boundary problems. *International Hydrographic Review*, 51 (1):157-173, 1977.

U.S. Department of State. Developing standard guidelines for evaluating straight baselines. *Limits in the Seas*, No. 106, 1987.

Vivero, J. L. S. de. El nuevo orden oceánico: consecuencias territoriales. Sevilla, 1985.

Wiktor, C. L. and Foster, L. A. (eds.), Marine affairs bibliography. Halifax, Nova Scotia, Dalhousie Law School, 1980.

LIST OF FIGURES

Handbook
on the Delimitation of Maritime Boundaries

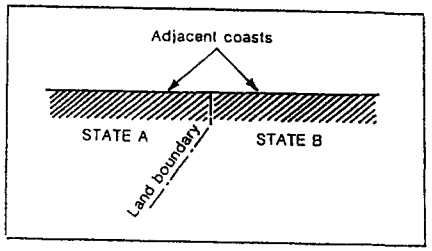
Division for Ocean Affairs and the Law of the Sea
Office of Legal Affairs
United Nations • New York, 2000

ANNEX V. TECHNICAL TERMINOLOGY [1]

ADJACENT COASTS

The coasts lying either side of the land boundary between two adjoining States.

Figure 1 - Adjacent Coasts



ARCHIPELAGIC BASELINES

See: BASELINE.

ARCHIPELAGIC STATE

As defined in article 46.

See: ARCHIPELAGIC WATERS; BASELINE; ISLANDS.

ARCHIPELAGIC WATERS

The waters enclosed by archipelagic baselines.

See: articles 46, 47, 49.

See: ARCHIPELAGIC STATE; BASELINE; INTERNAL WATERS.

ARTIFICIAL ISLAND

See: INSTALLATION (OFFSHORE).

---

[1] Selected terminology from A Manual on Technical Aspects of the United Nations Convention on the Law of the Sea,1982, Special Publication No. 51, 3rd edition, (Monaco, International Hydrographic Bureau, July 1993).

N.B. All article references in the terminology list are to articles of the 1982 Convention.

ATOLL

A ring-shaped reef with or without an island situated on it surrounded by the open sea, that encloses or nearly encloses a lagoon.

An atoll is usually formed on the top of a submerged volcano by coral polyps.

Where islands are situated on atolls the territorial sea baseline is the seaward low-water line of the reef as shown by the appropriate symbol on charts officially recognized by the coastal State (art. 6).

For the purpose of computing the ratio of water to land when establishing archipelagic waters, atolls and the waters contained within them may be included as part of the land area (art. 47, para. 7).

See: ARCHIPELAGIC WATERS; BASELINE; ISLANDS; LOW-WATER LINE; REEF.

BANK

With reference to article 76, para. 6:

A submarine elevation located on a continental margin over which the depth of water is relatively shallow.

With reference to article 9 it is that portion of land that confines a river.

It could also be a shallow area of shifting sand, gravel, mud, etc., such as a sand bank or a mud bank usually occurring in relatively shallow waters and constituting a danger to navigation.

See: CONTINENTAL SHELF, LOW-TIDE ELEVATION.

BASELINE

The line from which the outer limits of a State's territorial sea and certain other outer limits of coastal State jurisdiction are measured.

The term refers to the baseline from which the breadth of the territorial sea, the outer limits of the contiguous zone (art. 33, para. 2), the exclusive economic zone (art. 57) and, in some cases, the continental shelf (art. 76) are measured. It is also the dividing line between internal waters and territorial seas.

The type of the territorial sea baseline may vary depending on the geographical configuration of the locality, etc.

The "normal baseline" is the low-water line along the coast (including the coasts of islands) as marked on large-scale charts officially recognized by the coastal State (arts. 5 and 121, para. 2).

See: LOW-WATER LINE.

In the case of islands situated on atolls or of islands having fringing reefs, the baseline is the seaward low-water line of the reef, as shown by the appropriate symbol on charts officially recognized by the coastal State (art. 6).

Where a low-tide elevation is situated wholly or partly at a distance not exceeding the breadth of the territorial sea from the mainland or an island, the low-water line on that elevation may be used as part of the baseline (art. 13).

See: LOW-TIDE ELEVATION.

Straight baselines are a system of straight lines joining specified or discrete points on the low-water line, usually known as straight baseline turning points, which may be used only 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 (art. 7, para. 1).

See: STRAIGHT LINE.

Archipelagic baselines are straight lines joining the outermost points of the outermost islands and drying reefs which may be used to enclose all or part of an archipelago which forms all or part of an archipelagic State (art. 47).

BASEPOINT

A basepoint is any point on the baseline. In the method of straight baselines, where one straight baseline meets another baseline at a common point, one line may be said to "turn" at that point to form another baseline. Such a point may be termed a "baseline turning point" or simply "basepoint".

BAY

For the purposes of this Convention, a bay is a well-marked indentation whose penetration is in such proportion to the width of its mouth as to contain land-locked waters and constitute more than a mere curvature of the coast. An indentation shall not, however, be regarded as a bay unless its area is as large as, or larger than, that of the semicircle whose diameter is a line drawn across the mouth of that indentation (art. 10, para. 2).

This definition is purely legal and is applicable only in relation to the determination of the limits of maritime zones. It is distinct from and does not replace the geographical definitions used in other contexts.

This definition does not apply to "historic" bays (art. 10, para. 6).

See: HISTORIC BAYS.

CAP

With reference to article 76, paragraph 6:

A submarine feature with a rounded, cap-like top. Also defined as a plateau or flat area of considerable extent, dropping off abruptly on one or more sides.

CHART

A NAUTICAL CHART specially designed to meet the needs of marine navigation. It depicts such information as depths of water, nature of the seabed, configuration and nature of the coast, dangers and aids to navigation, in a standardized format; also called, simply, chart.

See: BASELINE; COAST; DANGER TO NAVIGATION; GEODETIC DATUM; LOW-WATER LINE; SEABED.

CLOSING LINE

A dividing line between the internal waters and the territorial seas of a coastal State enclosing a river mouth (art. 9), a bay (art. 10) or a harbour (art. 11); of the archipelagic waters of an archipelagic State (art. 50).

See: ARCHIPELAGIC STATE; BASELINE; BAY; HARBOUR WORKS; LOW-WATER LINE.

COAST

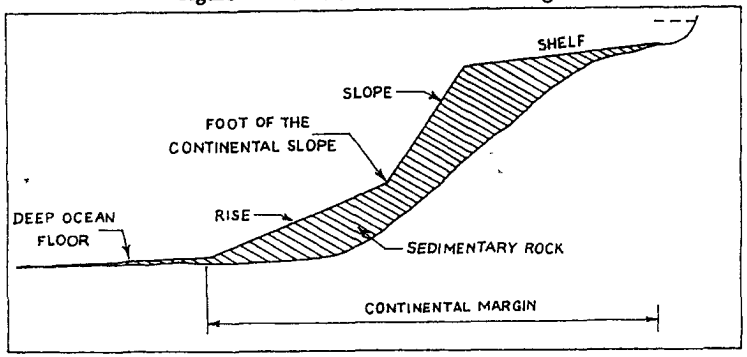
The edge or margin of land next to the sea.

See: BASELINE; LOW-WATER LINE.

CONTINENTAL MARGIN

As defined in article 76, paragraph 3, as follows: "The continental margin comprises the submerged prolongation of the land mass of the coastal State, and consists of the seabed and subsoil of the shelf, the slope and the rise. It does not include the deep ocean floor with its oceanic ridges or the subsoil thereof".

Figure 2 - Profile of the Continental Margin



See: CONTINENTAL RISE; CONTINENTAL SHELF; CONTINENTAL SLOPE; FOOT OF THE CONTINENTAL SLOPE; DEEP OCEAN FLOOR; SEABED.

CONTINENTAL RISE

A submarine feature which is that part of the continental margin lying between the continental slope and the deep ocean floor; simply called the rise in the Convention.

It usually has a gradient of 0.5° or less and a generally smooth surface consisting of sediment.

See: CONTINENTAL MARGIN; CONTINENTAL SLOPE; DEEP OCEAN FLOOR; FOOT OF THE CONTINENTAL SLOPE.

CONTINENTAL SHELF

For the purposes of the Convention, it is defined in article 76, paragraph 1, as follows:

"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 edge of the continental margin, or to a 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 margin does not extend up to that distance."

The limits of the continental shelf or continental margin are determined in accordance with the provisions of article 76 of the Convention. If the continental margin extends beyond a 200-nautical mile limit measured from the appropriate baselines, the provisions of article 76, paragraphs 4 to 10, apply.

See: CONTINENTAL MARGIN, OUTER LIMIT.

CONTINENTAL SLOPE

That part of the continental margin that lies between the shelf and the rise. Simply called the slope in article 76, paragraph 3.

The slope may not be uniform or abrupt, and may locally take the form of terraces. The gradients are usually greater than 1.5°.

See: CONTINENTAL MARGIN; CONTINENTAL SHELF; CONTINENTAL RISE; DEEP OCEAN FLOOR; FOOT OF THE CONTINENTAL SLOPE.

DANGER TO NAVIGATION

A hydrographic feature or environmental condition that might hinder, obstruct, endanger or otherwise prevent safe navigation.

DEEP OCEAN FLOOR

The surface lying at the bottom of the deep ocean with its oceanic ridges, beyond the continental margin.

The continental margin does not include the deep ocean floor with its oceanic ridges or the subsoil thereof.

See: CONTINENTAL MARGIN; OCEANIC RIDGE; SEABED; SUBMARINE RIDGE; SUBSOIL.

DELTA

A tract of alluvial land enclosed and traversed by the diverging mouths of a river.

In localities where the method of straight baselines is appropriate, and where because of the presence of a delta and other natural conditions the coastline is highly unstable, appropriate basepoints may be selected along the furthest seaward extent of the low-water line and, notwithstanding subsequent regression of the low-water line, the straight baselines shall remain effective until changed by the coastal State in accordance with the Convention (art.7, para. 2).

See: BASELINE; LOW-WATER LINE.

EQUIDISTANT LINE

See: MEDIAN LINE.

ESTUARY

The tidal mouth of a river, where the seawater is measurably diluted by the fresh water from the river.

See: BAY; RIVER; DELTA.

FACILITY (PORT)

See: HARBOUR WORKS.

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 of gradient at its base" (art. 76, para. 4(b)).

It is the point where the continental slope meets the continental rise or, if there is no rise, the deep ocean floor.

To determine the maximum change of gradient requires adequate bathymetry covering the slope and a reasonable extent of the rise, from which a series of profiles may be drawn and the point of maximum change of gradient located.

The two methods laid down in article 76, paragraph 4, for determining the outer limit of the continental shelf depend upon the foot of the continental slope.

See: CONTINENTAL RISE; CONTINENTAL SHELF; CONTINENTAL SLOPE.

GEODETIC DATA

Parameters defining geodetic or astronomical reference systems and their mutual relations; horizontal, vertical and/or three dimensional coordinates of points referred to such system; observations of high precision from which such coordinates may be derived; ancillary data such as gravity, deflections of the vertical or geoid separation at points or areas referred to such systems.

See: GEODETIC DATUM; GEODETIC REFERENCE SYSTEMS.

GEODETIC DATUM

A geodetic datum positions and orients a geodetic reference system in relation to the geoid and the astronomical reference system.

A local or regional datum takes a reference ellipsoid to best fit the geoid in its (limited) area of interest and its origin of Cartesian coordinates will usually be displaced from the mass-centre of the earth - but if well oriented, it will have its Cartesian axes parallel to those of the astronomical reference system.

A global datum will normally take the most recent international geodetic reference system (currently GRS 80) which is designed to best fit the global geoid, it will therefore seek to place its origin of Cartesian coordinates at the mass-centre of the earth, with its Cartesian axes well oriented.

If a datum point is used to define a datum, one will specify:

(a) Deflections of the vertical (Astronomic minus geodetic latitude, longitude and azimuth) there - if not zero they will need to satisfy the Laplace equation connecting astronomic and geodetic longitudes and azimuths, or the datum will not be well oriented.

(b) Geoidal separation there, which may or may not be zero.

It is not normal to use a datum point for global datums as the mass-centre requirement cannot then be met.

The locally horizontal component of a (three-dimensional) geodetic datum is also known as the horizontal datum or horizontal reference datum.

The position of a point common to two different surveys on different geodetic datums will be assigned two different sets of geodetic geographical coordinates; it is important therefore to know the geodetic datum when a position is defined.

The datum must be specified when lists of geographicals are used to define the baselines and the limits of some zones of jurisdiction (art. 16, para. 1; art. 47, para. 8; art. 75, para. 1; art. 84, para. 1).

See: BASELINE; GEOGRAPHICAL COORDINATES; GEODETIC DATA; GEODETIC REFERENCE SYSTEMS.

GEODETIC REFERENCE SYSTEMS

A geodetic reference system is defined by specifying an ellipsoid of rotation (also termed a spheroid by United Kingdom/United States geodesists) which requires:

(a) Semi-axis major and flattening; or

(b) Semi-axis major and second zonal gravity harmonic (J).

The second alternative has been adopted by the International Association of Geodesy (they also specify the earth's gravitational constant, GM, and the angular velocity, W) but the two definitions are equivalent in practice.

Points at zero geodetic height lie on the surface of the ellipsoid, while other points are projected down (by the amount of their geodetic height) to the feet of normals to the ellipsoid.

Coordinates are three-dimensional Cartesians referred to an origin at the centre of the spheroid with the z-axis along the axis of symmetry, or geodetic geographicals with an associated geodetic height.

See: GEOGRAPHICAL COORDINATES; GEODETIC DATA; GEODETIC DATUM.

GEOGRAPHICAL COORDINATES

Angular parameters of latitude and longitude which define the position of a point on the earth's surface and which, in conjunction with a height, similarly define positions vertically above or below such a point.

Astronomical latitude and longitude relate to the mean axis of rotation of the earth and the direction of the local plumb-line vertical: latitude is the angle this vertical makes with a plane normal to the rotation axis; longitude is the angle that a plane containing this vertical and a line parallel to the rotation axis makes with a reference plane through the rotation axis (the Greenwich meridian plane).

Geodetic latitude and longitude are similarly defined with the earth's rotation axis replaced by that of the reference ellipsoid (the z-axis); the plumb-line vertical replaced by the normal to the reference ellipsoid; and the plane of the meridian of Greenwich replaced by the xz-coordinate plane of the reference ellipsoid.

Latitude varies from 0 to 90 degrees North or South of the equator; lines joining all points of equal latitude are known as parallels of latitude (or just "parallels").

Longitude varies from 0 to 180 degrees East or West of the Greenwich meridian; lines joining all points of equal longitude are known as meridians.

HARBOUR WORKS

Permanent man-made structures built along the coast which form an integral part of the harbour system, such as jetties, moles, quays or other port facilities, coastal terminals, wharves, breakwaters, sea walls, etc. (art. 11).

Such harbour works may be used as part of the baseline for the purpose of delimiting the territorial sea and other maritime zones.

See: BASELINE; PORT.

HISTORIC BAY

See article 10, paragraph 6. This term has not been defined in the Convention. Historic bays need not meet the requirements prescribed in the definition of "bay" contained in article 10, paragraph 2.

HYDROGRAPHIC SURVEY

The science of measuring and depicting those parameters necessary to describe the precise nature and configuration of the seabed and coastal strip, its geographical relationship to the land mass, and the characteristics and dynamics of the sea.

Hydrographic surveys may be necessary to determine the features that constitute baselines or basepoints and their geographical positions.

During innocent passage, transit passage and archipelagic sea lane passage of foreign ships, including marine scientific research and hydrographic survey ships, no research or survey activities may be carried out without the prior authorization of the coastal State(s) (art.19, para. 2(j); art. 40 and art. 54).

See: BASELINE; GEOGRAPHICAL COORDINATES.

INSTALLATION (OFFSHORE)

Man-made structure in the territorial sea, exclusive economic zone or on the continental shelf usually for the exploration or exploitation of marine resources. They may also be built for other purposes such as marine scientific research, tide observations, etc.

Offshore installations or artificial islands shall not be considered as permanent harbour works (art. 11) and therefore may not be used as part of the baseline from which to measure the breadth of the territorial sea.

Where States may establish straight baselines or archipelagic baselines, low-tide elevations having lighthouses or similar installations may be used as basepoints (art. 7, para. 4, and art. 47, para. 4).

Artificial islands, installations and structures do not possess the status of islands. They have no territorial sea of their own and their presence does not affect the delimitation of the territorial sea, the exclusive economic zone or the continental shelf (art. 60, para. 8).

Article 60 provides, inter alia, for due notice to be given for the construction or removal of installations, and permanent means for giving warning of their presence must be maintained. Safety zones, not to exceed 500 metres measured from their outer edges, may be established. Any installations abandoned or disused shall be removed, taking into account generally accepted international standards.

ISLANDS

As defined in article 121, paragraph 1.

Maritime zones of islands are referred to in article 121, paragraph 2.

See: ATOLL; BASELINE; CONTIGUOUS ZONE; CONTINENTAL MARGIN; ROCK; TIDE.

ISOBATH

A line representing the horizontal contour of the seabed at a given depth.

See: article 76, paragraph 5.

LATITUDE

See: GEOGRAPHICAL COORDINATES.

LONGITUDE

See: GEOGRAPHICAL COORDINATES.

LOW-TIDE ELEVATION

A low-tide elevation is a naturally formed area of land which is surrounded by and above water at low tide but submerged at high tide (art.13, para. 1).

Low-tide elevation is a legal term for what are generally described as drying banks or rocks. On nautical charts they should be distinguishable from islands.

Where a low-tide elevation is situated wholly or partly at a distance not exceeding the breadth of the territorial sea from the mainland or an island, the low-water line on that elevation may be used as the baseline for measuring the territorial sea (art. 13, para. 1).

Article 7, paragraph 4, and article 47, paragraph 4, refer to the use of low-tide elevations as basepoints in a system of straight baselines or archipelagic baselines.

See: BANK BASELINE; CHART; INSTALLATION (OFFSHORE); LOW-WATER LINE).

LOW-WATER LINE/LOW-WATER MARK

The intersection of the plane of low water with the shore. The line along a coast, or beach, to which the sea recedes at low water.

It is the normal practice for the low-water line to be shown as an identifiable feature on nautical charts unless the scale is too small to distinguish it from the high-water line or where there is no tide so that the high- and low-water lines are the same.

The actual water level to which soundings on a chart are referred is known as Chart Datum.

See: BASELINE; CHART; TIDE.

MEDIAN LINE

A line every point of which is equidistant from the nearest points on the baselines of two States.

It is usual to refer to "median line" in the case of opposite coasts and equidistant line in the case of adjacent coasts, although this distinction is not made in the Convention.

See: ADJACENT COASTS; BASELINE; EQUIDISTANT LINE; OPPOSITE COASTS.

MILE

See: NAUTICAL MILE.

MOUTH (BAY)

Is the entrance to the bay from the ocean?

Article 10, paragraph 2, states that "a bay is a well-marked indentation" etc., and the mouth of that bay is "the mouth of that indentation". Article 10, paragraphs 3; 4 and 5, refer to "natural entrance points of a bay." Thus it can be said that the mouth of a bay lies between its natural entrance points.

In other words, the mouth of a bay is its entrance.

Although some States have developed standards by which to determine natural entrance points to bays, no international standards have been established.

See: BASELINE; BAY; CLOSING LINE; ESTUARY; LOW-WATER LINE.

MOUTH (RIVER)

The place of discharge of a river into the ocean.

If a river flows directly into the sea, the baseline shall be a straight line across the mouth of the river between points on the low-water line of its banks (art. 9). Note that the French text of the Convention is "Si un fleuve se jette dans la mer sans former d'estuaire ..." (underlining added).

No limit is placed on the length of the line to be drawn.

The fact that the river must flow "directly into the sea" suggests that the mouth should be well marked, but otherwise the comments on the mouth of a bay apply equally to the mouth of a river.

See: BASELINE; CLOSING LINE; ESTUARY; LOW-WATER LINE; RIVER.

NAUTICAL CHART

See: CHART.

NAUTICAL MILE (M)

A unit of distance used primarily in navigation. Most of the maritime nations have accepted the international nautical mile of 1852 metres adopted by the International Hydrographic Organization.

NAVIGATIONAL CHART

See: NAUTICAL CHART.

OCEANIC PLATEAU

A comparatively flat topped elevation of the seabed which rises steeply from the ocean floor and is of considerable extent across the summit.

For the purpose of computing the ratio of water to land enclosed within archipelagic baselines, land areas may, inter alia, include waters lying within that part of a steep-sided oceanic plateau which is enclosed or nearly enclosed by a chain of limestone islands and drying reefs lying on its perimeter (art. 47, para. 7).

See: ARCHIPELAGIC STATE; BASELINE.

OCEANIC RIDGE

A long elevation of the deep ocean floor with either irregular or smooth topography and steep sides.

Such ridges are not part of the continental margin (art. 76, para. 3).

See: DEEP OCEAN FLOOR.

OPPOSITE COASTS

The geographical relationship of the coasts of two States facing each other.

Maritime zones of States having opposite coasts may require boundary delimitation to avoid overlap.

OUTER LIMIT

The extent to which a coastal State claims or may claim a specific jurisdiction in accordance with the provisions of the Convention.

In the case of the territorial sea, the contiguous zone and the exclusive economic zone, the outer limits lie at a distance from the nearest point of the territorial sea baseline equal to the breadth of the zone of jurisdiction being measured (art. 4; art. 33, para. 2; and art. 57).

In the case of the continental shelf, where the continental margin extends beyond 200 nautical miles from the baseline from which the territorial sea is measured, the extent of the outer limit is described in detail in article 76.

See: BASELINE; CONTINENTAL MARGIN; CONTINENTAL SHELF; ISOBATH.

PARALLEL OF LATITUDE

See: GEOGRAPHICAL COORDINATES.

PLATFORM

See: INSTALLATION (OFFSHORE).

PORT

A place provided with various installations, terminals and facilities for loading and discharging cargo or passengers.

REEF

A mass of rock or coral which either reaches close to the sea surface or is exposed at low tide.

DRYING REEF. That part of a reef which is above water at low tide but submerged at high tide.

FRINGING REEF. A reef attached directly to the shore or continental land mass, or located in their immediate vicinity.

In the case of islands situated on atolls or of islands having fringing reefs, the baseline is the seaward low-water line of the reef, as shown by the appropriate symbol on charts officially recognized by the coastal State (art. 6).

See: ATOLL; BASELINE; ISLAND; LOW-WATER LINE.

RISE

See: CONTINENTAL RISE.

RIVER

A relatively large natural stream of water.

ROADSTEAD

An area near the shore where vessels are intended to anchor in a position of safety; often situated in a shallow indentation of the coast.

"Roadsteads which are normally used for loading, unloading and anchoring of ships, and which would otherwise be situated wholly or partly outside the outer limit of the territorial sea, are included in the territorial sea" (art. 12).

In most cases roadsteads are not clearly delimited by natural geographical limits, and the general location is indicated by the position of its geographical name on charts. If article 12 applies, however, the limits must be shown on charts or must be described by a list of geographical coordinates.

See: CHART; GEOGRAPHICAL COORDINATES.

ROCK

Consolidated lithology of limited extent.

There is no definition given in the Convention. It is used in Convention article 121, paragraph 3, which states:

"Rocks which cannot sustain human habitation or economic life of their own shall have no exclusive economic zone or continental shelf."

See: ISLAND; LOW-TIDE ELEVATION.

SCALE

The ratio between a distance on a chart or map and a distance between the same two points measured on the surface of the earth (or other body of the universe).

Scale may be expressed as a fraction or as a ratio. If on a chart a true distance of 50,000 metres is represented by a length of 1 metre the scale may be expressed as 1:50 000 or as 1/50 000. The larger the divisor the smaller the scale of the chart.

See: CHART.

SEABED

The top of the surface layer of sand, rock, mud or other material lying at the bottom of the sea and immediately above the subsoil.

The seabed may be that of the territorial sea (art. 2, para. 2), archipelagic waters (art. 49, para. 2), the exclusive economic zone (art. 56), the continental shelf (art. 76), the high seas (art. 112, para. 1), or the Area (arts. 1, para. 1(1) and 133). It may be noted, however, that in reference to the surface layer seaward of the continental rise, article 76 uses the term "deep ocean floor" rather than seabed.

See: CONTINENTAL SHELF; DEEP OCEAN FLOOR; SUBSOIL.

SEDIMENTARY ROCK

Rock formed by the consolidation of sediment that has accumulated in layers. (The term sedimentary rock is used in art. 76, para. 4(a)(i)).

The sediments may consist of rock fragments or particles of various sizes (conglomerate, sandstone, shale), the remains or products of animals or plants (certain limestones and coal), the product of chemical action or of evaporation (salt, gypsum, etc.) or a mixture of these materials.

SHELF

Geologically an area adjacent to a continent or around an island and extending from the low-water line to the depth at which there is usually a marked increase of slope to greater depth.

See: CONTINENTAL SHELF.

SLOPE

See: CONTINENTAL SLOPE.

SPUR

A subordinate elevation, ridge or rise projecting outward from a larger feature.

The maximum extent of the outer limit of the continental shelf along submarine ridges is 350 nautical miles from the baselines. This limitation, however, "... does not apply to submarine elevations that are natural components of the continental margin, such as plateaux, rises, caps, banks and spurs." (art. 76, para. 6)

See: BANK; CAP; CONTINENTAL SHELF; SUBMARINE RIDGE.

STRAIGHT BASELINE

See: BASELINE.

STRAIGHT LINE

Mathematically the line of shortest distance between two points in a specified space or on a specified surface.

See: BASELINE; CONTINENTAL MARGIN; CONTINENTAL SHELF.

STRUCTURE

See: INSTALLATION (OFFSHORE).

SUBMARINE RIDGE

An elongated elevation of the sea floor, with either irregular or relatively smooth topography and steep sides.

On submarine ridges the outer limit of the continental shelf shall not exceed 350 nautical miles from the territorial sea baselines. This does not apply in the case of submarine elevations which are natural components of the continental margin of a coastal State (art. 76, para. 6).

See: CONTINENTAL SHELF.

SUBSOIL

All naturally occurring matter lying beneath the seabed or deep ocean floor.

The subsoil includes residual deposits and minerals as well as the bedrock below.

The Area and coastal State's territorial sea, archipelagic waters, exclusive economic zone and continental shelf all include the subsoil (arts. 1, para. 1(1); 2, para. 2; 49, para. 2; 56, para. 1(a); and 76, para. 1).

See: CONTINENTAL SHELF; SEABED.

THALWEG

The line of maximum depth along a river channel. It may also refer to the line of maximum depth along a river valley or in a lake.

TIDE

The periodic rise and fall of the surface of the oceans and other large bodies of water due principally to the gravitational attraction of the Moon and Sun on a rotating earth.

CHART DATUM: The tidal level to which depths on a nautical chart are referred constitutes a vertical datum called Chart Datum.

While there is no universally agreed Chart Datum level, however, under an International Hydrographic Conference resolution (A 2.5), it "shall be a plane so low that the tide will seldom fall below it".

See: CHART; LOW-WATER LINE.

WATER COLUMN

A vertical continuum of water from sea surface to seabed.

See: SEABED.