

# Marine Science and the Law of the Sea

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## Introduction

Articles about the Law of the Sea Conference and its implications are certainly not among the most popular literature for marine scientists. Unfortunately, however, this conference and the Draft Convention it is now considering may have more impact on marine science than any of our recent discoveries and hypotheses.

The present law of the sea negotiations (more correctly called the Third United Nations Conference on the Law of the Sea or UNCLOS III) officially started in 1973. Over 150 countries are involved in what is easily the most complex series of negotiations ever conducted. Among the important issues are freedom of navigation for military and commercial vessels, environmental protection, resource access and control, and many legal aspects as well as procedures governing marine science in about 40 percent of the ocean. How these meetings evolved, pros and cons of the major issues, and negotiating techniques are discussed elsewhere [see, for example, *Darman*, 1979; *Kronmiller*, 1979; *Breaux*, 1979; *Aldrich*, 1980; *Richardson*, 1980].

A recent development is that the Reagan administration has decided to review all aspects of the Draft Convention to see how it affects various U.S. interests. This review comes at a time when many countries thought that negotiations were almost complete and that only minor points remained for discussion. Regardless of how one feels about a treaty it is fair to say that some aspects, such as deep-sea mining (i.e., nodules) are not too favorable to U.S. interests. Indeed, many would argue that the present Draft Convention has enough flaws in it to prevent its passage by the U.S. Senate. It is very possible that the United States may try for improvements on some issues, which in turn could yield benefits or risks to marine science. It should be appreciated that few countries place the same value on the freedom of marine science research as does the United States. Countries that have tried to protect this freedom include primarily the United States, the U.S.S.R. (until 1976), the Federal Republic of Germany, and The Netherlands, with occasional support from Japan [*Miles*, 1981]. Only the United States and the U.S.S.R. have active ocean-wide research programs, whereas other developed countries usually have regionally based efforts. Before proceeding further, some background is appropriate.

Marine science prior to UNCLOS III was governed by the regulations established in the First Conference on the Law of the Sea, which was held in 1958; this was the first time that marine scientific research was stated in international law. One of the four conventions that resulted from the 1958 Conference—the Convention on the Continental Shelf—said that

'the consent of the coastal State shall be obtained in respect of any research concerning the continental shelf. Nevertheless, the coastal State shall not normally withhold its consent if the request is submitted by a qualified institution with a view to purely scientific research into the physical or biological characteristics of the continental shelf, subject to the proviso that the coastal State shall have the right, if it so desires, to participate or to be represented in the research, and that in any event the results shall be published.'

Even this relatively unrestrictive statement eventually caused some problems for marine research [*Kildow*, 1973; *Cheek*, 1973; *Ocean Policy Committee*, 1977]. *Wooster* [1981] recently surveyed the academic, Navy, and NOAA ship operators concerning difficulties for marine research in foreign waters during the 1972–1976 period. He found that

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in over one fourth of the requests (total of 407), access was denied or inordinately delayed. Prior to and following the first conference and a second one held in 1960, some countries expanded their territorial claims seaward usually also including some control over scientific research. These extended claims, sometimes reaching out to 200 nautical miles, and the anticipation of new marine resources were among the factors leading to UNCLOS III.

UNCLOS III negotiations have produced several iterations of a potential treaty. The most recent one, referred to as the Draft Convention on the Law of the Sea, has been treated as being close to, if not almost, the final document. Although small revisions have been made over the years to the marine scientific research articles, the basic conditions for research in the territorial sea, the exclusive economic zone (EEZ), and the remaining regions of the ocean are fairly clear. Some argue that the conditions are already part of international law. The new regime for the ocean will, without a doubt, change the way in which marine scientists and marine scientific research operate. The Draft Convention will restrict many activities of U.S. marine scientists, but it may also offer certain opportunities.

An important point in assaying the impact of UNCLOS III on marine science is whether science would be better served without a treaty. It is easy to conclude, however, that although the Draft Convention is not very good for marine science, it is, because of other events, better than no treaty. The reason for this apparently contradictory statement is that as of February 1981, 88 coastal states have already declared some kind of a 200 nautical mile zone out of a total of 135 coastal states. In addition, 69 of these states either specifically or indirectly claim jurisdiction over marine research in their 200 mile zone [M. H. Katsouros, personal communication, 1981]. With the demise or absence of a treaty, it seems reasonable that the remaining countries will also adopt at least a 200-mile zone. It is also reasonable to assume that the conditions for marine scientific research, without a treaty, will be at least as restrictive as those in the present Draft Convention. These rules would probably differ from country to country and will present a potential administrative quagmire for the U.S. Department of State and, thus, also for the U.S. marine scientists and administrators who will need the State Department for information and permission to do research. Another point is that continuing extension of states' claims farther into the ocean and additional rules for marine science are less likely once a treaty is in place than without one since a treaty will define and limit most jurisdiction.

The general review of the Draft Convention initiated by the Reagan Administration could have an impact on marine scientific research. If the United States decides to withdraw from further negotiations, it is hard to imagine that the science articles could be improved (since the United States is the principle country concerned with marine science in a positive sense), and indeed they could get worse. If the treaty negotiations were to fail because of the United States' withdrawal, scientific research could suffer if countries attempted retribution against the United States for its perceived role in spoiling the conference. If the United States continues in the conference but puts its emphasis in obtaining better conditions for deep-sea mining, some scientific benefits could be negotiated away. Another possibility is that the United States, in its review, decides that improvements in the marine scientific research articles are important and, in some manner, successfully negotiates improvements.

The Law of the Sea negotiations establish several new zones in the ocean and redefine some old ones (Figure 1) within each there are conditions for marine scientific research. The principle zones for marine science are internal waters, territorial sea, straits, archipelagos, exclusive economic zone (EEZ), continental shelf beyond 200 miles, and the 'Area.' A brief description of the new marine scientific regime for each region follows.

## Specific Regions

### Internal Waters

Coastal states, under the Draft Convention, have complete sovereignty over activities within their internal waters. These waters include rivers, bays, lakes, and other areas on the landward side of the baseline from which the terri-

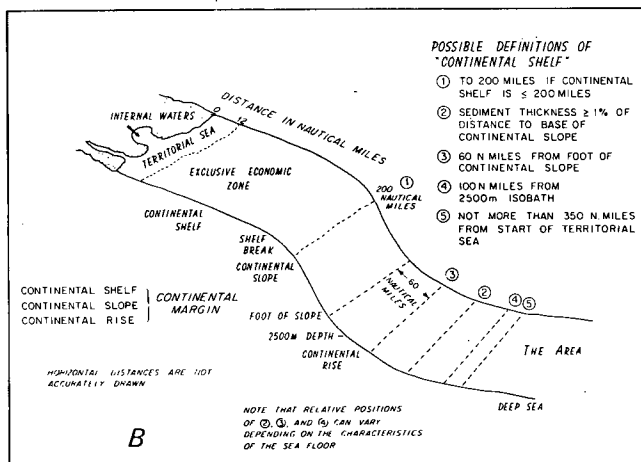
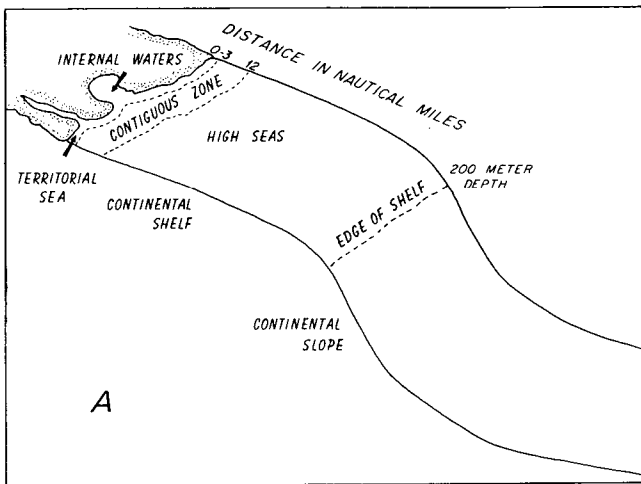


Fig. 1. A comparison of the major divisions of the ocean (a) under the 1958 Geneva Convention and (b) under the Draft Convention (see text for further details).

torial sea is delineated. There are only slight changes from the 1958 Convention on the Territorial Sea and Contiguous Zone, mainly in the methods by which the baseline is measured.

### Territorial Sea

The Draft Convention establishes a territorial sea, 12 nautical miles wide, a point that essentially is now an established principle in international law. This, ironically, could actually be an advantage to some scientific work. The U.S. State Department, at present, recognizes only a 3-mile-wide territorial sea; thus, a U.S. researcher has a problem if he or she wants to work, say, 100 miles off a country that has declared a 200-mile territorial sea. In this fairly common situation, the U.S. State Department generally would not make the permission request, since to do so would be a tacit acceptance of that country's claim. Alternatives for a researcher are to request permission to work within 3 miles of the coast (in which case the U.S. State Department could ask for permission) and actually to conduct the research there (and at 100 miles) at an increased cost to the project or to avoid the problem and work outside of 200

miles. With an internationally accepted 12-mile territorial sea and the protection afforded to the coastal state by the EEZ (see next section), some of the diplomatic problems associated with various territorial sea claims should be eliminated. This is not a small point, since, as of May 1981, 80 states claim a 12-mile territorial sea, 25 claim more than 12 miles (14 of these claim 200 miles), and only 28 states claim less than 12 miles (Office of the Geographer, U.S. Department of State). The Draft Convention, if accepted, should eliminate claims of more than 12 miles for a territorial sea.

Within the territorial sea the coastal state has 'the exclusive right to regulate, authorize and conduct marine scientific research, . . . [which] shall be conducted only with the express consent of and under the conditions set forth by the coastal State' (Article 245).

Although coastal states have sovereignty over the territorial sea, there is a right of innocent passage. However, 'the carrying out of research or survey activities' is eliminated as an accepted activity under innocent passage. Thus the control over marine scientific activities in a well-defined territorial sea are clear. However, no statements are made concerning the mechanisms necessary to get permission or the conditions that a coastal state can impose on a researching state or institution if they want to work in a country's territorial sea. Presumably, such arrangements would be made on an ad hoc basis.

### Straits

The international acceptance of a 12-mile-wide territorial sea will affect many previously international straits. One hundred and sixteen straits are more than 6 but less than 24 miles wide and would now be included within the territorial seas of the adjacent states [U.S. State Department, 1974]. Article 40 in the Draft Convention says that 'foreign ships, including marine scientific research and hydrographic survey ships, may not carry out any research or survey activities without prior authorization of the States bordering straits.' This restriction could make it very difficult to conduct research in such straits, in part because usually two or more states will have to give permission. Straits between major bodies of water (Bab el Mandeb or Gibraltar, for example) are obviously important and interesting areas for study. A further complication concerning strait research is the absence of statements concerning the mechanisms for getting permission to do research and the restrictions or conditions that a coastal state can place on the research. Implied consent, which exists in the EEZ, does not extend to research in straits where the unclear conditions and mechanisms of the territorial sea apply.

### Archipelagos

A series of articles in the Draft Convention will permit island states to define baselines for archipelagic waters. The actual extent of these waters is not clear, and definition probably awaits jurisdiction. What is clear is that the island state will have territorial sea rights over its archipelagic waters for scientific research.

### Exclusive Economic Zone

The exclusive economic zone or EEZ is a new concept and presents a major problem for marine science. It extends 200 nautical miles (370 km) from the baseline from which the territorial sea is measured (Figure 1b). Thus, it includes all the coastal waters of the world and most of the continental shelves (in the geological sense). It encloses (with the territorial sea) about 32% of the ocean (Figure 2). Prior to UNCLOS III much of this area was open to many forms of marine scientific research. The conditions for marine scientific research in another country's EEZ are consistent with numerous requirements. The important aspects are as follows:

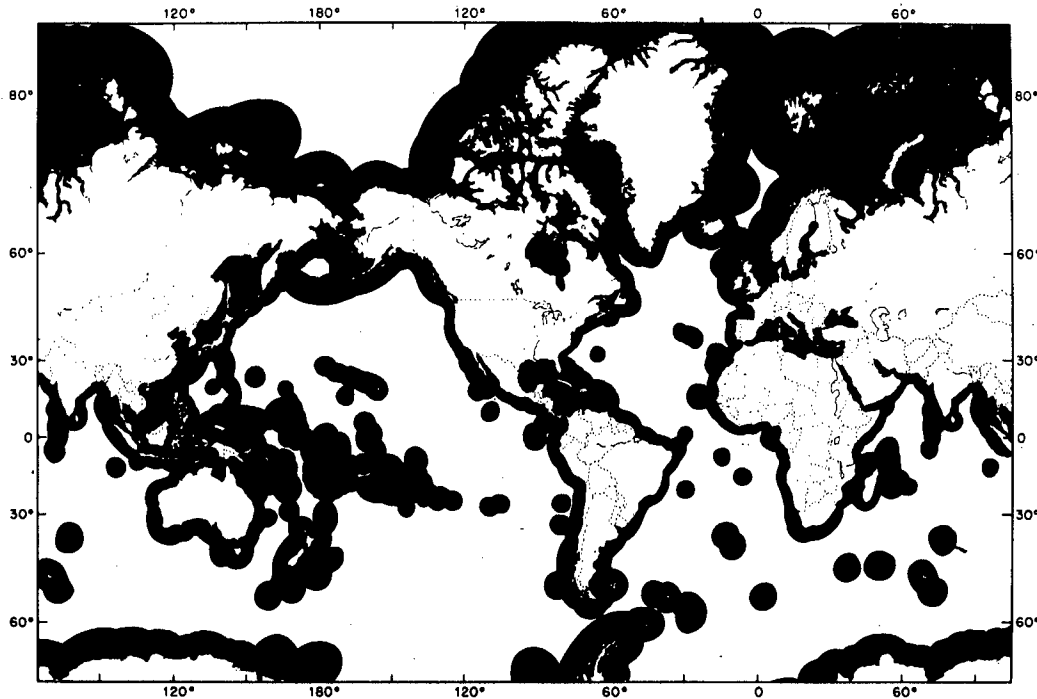


Fig. 2. The area of the ocean covered by a 200-nautical mile Exclusive Economic Zone (EEZ). Note that this is a Mercator projection and that the size of the polar regions is exaggerated [from Ross, 1980].

1. Consent is necessary and 'shall in normal circumstances' be granted (Article 248, part 2). It can be denied if the project (a) 'is of direct significance for the exploration and exploitation of natural resources, whether living or non-living; (b) involves drilling into the continental shelf, the use of explosives or the introduction of harmful substances into the marine environment; (c) involves the construction, operation or use of artificial islands . . .'; (d) contains inaccurate information 'or if the researching State or competent international organization has outstanding obligations to the coastal State from a prior research project' (Article 246, part 5). A coastal state's decision based on the above provisions is not reviewable by a third party.

2. Specific information must be supplied not less than 6 months before the start of the project. This includes (a) 'the nature and objectives of the project; (b) the method and means to be used, including name, tonnage, type and class of vessels and a description of scientific equipment; (c) the precise geographical areas in which the project is to be conducted; (d) the expected date of first appearance and final departure of the research vessels, or deployment of the equipment and its removal, as appropriate; (e) the name of the sponsoring institution, its director, and the person in charge of the project and (f) the extent to which it is considered that the coastal State should be able to participate or to be represented in the project' (Article 248).

3. Specific conditions must be met. Applicants asking for consent to conduct research must (a) 'ensure the right of the coastal State, if it so desires, to participate or be represented in the marine scientific research project, especially on board research vessels . . .'; (b) provide preliminary and final reports; (c) provide access for the coastal State to all data and samples from the project and 'furnish it with data which may be copied and samples which may be divided without detriment to their scientific value'; (d) provide, if re-

quested, 'an assessment of such data, samples and research results or provide assistance in their assessment or interpretation'; (e) ensure 'that research results are made internationally available through appropriate national or international channels'; (f) 'inform the coastal State immediately of any major change in the research programme' (Article 249).

4. 'Communications concerning the marine scientific research projects shall be made through appropriate official channels unless otherwise agreed' (Article 250). These channels probably are foreign ministries and the U.S. Department of State which surely will lessen the role of scientist-to-scientist relationships that so often have been successful in developing projects.

5. Coastal states can suspend research activities if (a) it is 'not being conducted in accordance with the information communicated' (i.e., information requested in Article 248) or if the conditions specified in Article 249 are not met; (b) there is a major change in the research project or activities (Article 253).

6. After permission to conduct research is granted, landlocked and geographically disadvantaged States in the region may request to receive the information provided under points 2 and 3, above. These states may also participate, when feasible, in the project through qualified experts, although the coastal state can object to the choice of expert.

Notwithstanding the foregoing conditions, consent is implied, and the researching state or organization may begin research 6 months after submitting its request if the coastal state has not denied consent within 4 months after receiving the information specified in Articles 248 and 249. However, the coastal state can ask for additional information and postpone, almost indefinitely if it desires, a decision. Therein lies one of the biggest problems of the Draft Convention: the lack of predictability concerning a cruise.

### Continental Shelf Beyond 200 Miles

The continental shelf in the Draft Convention has a complex definition (see Figure 1b) that extends it to a distance of 200 nautical miles (i.e., coterminous with the EEZ), if the continental margin (shelf, slope, and rise) does not extend to 200 nautical miles. If the continental margin extends beyond 200 nautical miles, several definitions come into play based on the thickness of the sedimentary rocks (how this thickness is determined is not stated) or distance from shore, but, in any case the limits of the continental shelf shall not exceed 350 nautical miles from the territorial sea baseline or 100 nautical miles from the 2,500 m isobath. The exact areal extent of this region cannot be determined at this time, but it is thought to be about 6–8% of the ocean. The provision concerning sediment thickness for delimitation certainly will permit confusion and allow for excessive claims.

All the marine scientific conditions mentioned above for the exclusive economic zone also apply to the Continental Shelf except that a coastal state may withhold consent only in specific areas that it has publicly designated as subject to exploitation or detailed exploratory operations within a reasonable period of time. In addition, research in the water column beyond the limits of the EEZ is permitted.

### 'The Area'

The region outside of coastal state jurisdiction is defined in the Draft Convention as the Area (i.e., the remaining 60% or so of the ocean). Basically, there are no significant restrictions in the Draft Convention concerning marine scientific research in the Area. However, there is a provision for a review conference to be held 15 years after commencement of commercial production of mineral resources (nodules) from the Area that could have the potential for mischief. A suspicious mind could imagine freedom of marine scientific research being regarded as a negotiating chip that might be surrendered by the United States or other developed countries in return for assured and continuing access to ocean minerals. If ocean thermal energy conversion (OTEC) is found to be a successful source of energy, regulations concerning the water column could also be developed.

The Draft Convention does say that 'states and competent international organizations shall promote and facilitate the development and conduct of marine scientific research in accordance with this Convention' (Article 239) and that coastal states should 'endeavour to adopt reasonable rules, regulations and procedures to promote and facilitate marine scientific research . . . beyond their territorial sea and to facilitate . . . access to their harbours and promote assistance for marine scientific research vessels' (Article 255). Although these statements are valuable, they are not binding.

### Publication Problems

A major general concern for science in the Draft Convention is publication rights and the flow of scientific data. Article 249, paragraph 2, requires 'prior agreement for making internationally available the research results of a project of direct significance for the exploration and exploitation of natural resources.' This is a confusing statement since Article 246, paragraph 5a, allows coastal states to withhold permission for research in their EEZ or on their continental shelf beyond 200 miles if the project is 'of direct significance for the exploration and exploitation of natural resources, whether living or non-living.' A difficulty for open publication is that almost any type of marine research could have some relevance to resources, and such an interpretation during or after the work could affect publication rights. It should also be repeated that the coastal State has complete discretion to determine what research is of direct significance for resources, and thus it is possible for a coastal

state to deny consent for almost any type of marine research. This is a major change from the 1958 convention where open research was encouraged.

### Implications and Recommendations

The above conditions clearly indicate the need for changes by U.S. marine scientists, institutions, and funding organizations in their manner of operation. Many of the articles mentioned above have pitfalls, and clearly any foreign country that wishes to refuse or delay a project should have no trouble finding a justification. Alternatively, if a country supports the research, the detailed requirements may become merely administrative tasks, except probably for foreign participation in research and sharing of data. These latter two items and others could involve additional costs beyond that of the initial project. As a coastal state can deny a research request from a country if there are outstanding obligations against a previous project by that country, how and when a research project ends should be clearly defined in early negotiations. The previously mentioned problems for publication is important and should also be reconciled in early stages of negotiation. The point that research activities can be suspended if there is a major (undefined) change in the project also poses potential difficulties. Changes can occur owing to ship breakdown, loss of equipment, weather problems, or adjustment of cruise tract or objectives in accordance with scientific information gained during the cruise. A coastal state will, under the Draft Convention, have the ability to affect or stop a project in almost any phase of its activity.

Once (or if) the Draft Convention is opened for ratification there might well be a transition period of several years before it is approved. During this period the U.S. State Department might either follow the present U.S. position on various issues (such as the 3-mile territorial sea) or the Draft Convention. Either situation could present potential for confusion, unnecessary delays, rejections, or avoidance of research requests. (Similar and perhaps more complex problems are possible if the United States withdraws from the treaty negotiations or if a treaty fails.)

Two indirectly related aspects may cause a reduction in U.S. marine science efforts within foreign EEZs. The first is that scientists and institutions just may avoid working in certain areas because of anticipated or past difficulties in conducting research there. This may already be seen in the general avoidance of waters off Trinidad and Tobago, India, and the Soviet continental shelf. By such avoidance, we can make the problems of the Draft Convention come true without even trying. Second, our own government may require a stricter adherence to the Draft Convention than individual countries might impose. In addition, having to deal through official channels could discourage many individual scientists. As marine scientists we should be prepared and willing to test and, if necessary, even challenge strict or arbitrary interpretations to see if we can work out agreeable arrangements, such as bilaterals [see *Open Policy Committee*, 1981] rather than letting activities overtake us.

For U.S. marine science and marine scientists to continue their future research activities in the world ocean certainly will imply additional administrative and funding considerations. Perhaps most important is that the development of foreign programs will require more time and impose additional costs. The necessity of having at least a 6-month lead time to get permission has implications for grant approval by organizations like the National Science Foundation and the Office of Naval Research, which tend to operate on a 1- or 2-year financial calendar.

Concern and opportunities should be established for preliminary meetings between U.S. and foreign scientists and administrators for the development of joint programs as well as to increased support for U.S. scientists to participate in international meetings such as the Intergovernmental Oceanographic Commission (IOC). Perhaps a separate

funding source should be established and used to explore and discuss possibilities for foreign programs. The importance of participating in international organizations like the IOC stems from Article 247 of the Draft Convention, which provides a mechanism by which such organizations can get consent for projects in the waters of member states.

Funding organizations and research institutions will have to be aware of the conditions on marine research under the new ocean regime and recognize that training of foreign scientists, data evaluation, and the like will be common components of research projects. Scientists, especially young ones, should not be penalized by participating in such activities even though it will divert them from their prime scientific objectives. Large or active institutions should consider the establishment of a foreign office that can help their scientists, administrators, and the funding agencies in developing and keeping track of foreign activities. It would be naive to think that the average scientist could wander through the potential maze of regulations imposed by the Draft Convention without any help and come out many years later with an administratively, scientifically, legally, and internationally satisfactory program, and be willing to try it again. On the other hand, the U.S. State Department, funding agencies, institutions, and individual scientists should be able to survive and even thrive in this new regime if we work together.

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