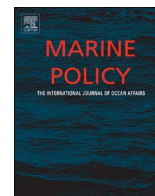




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Marine Policy

journal homepage: www.elsevier.com/locate/marpolMarine scientific research in Pacific Small Island Developing States[☆]Charlotte Salpin^{a,*}, Vita Onwuasoanya^{a,*}, Marie Bourrel^b, Alison Swaddling^b^a Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs, United Nations, New York, NY 10017, USA^b Geoscience Division, SPC, Mead Road, Private Mail Bag, GPO, Suva, Fiji

ARTICLE INFO

Article history:

Received 22 July 2016

Accepted 27 July 2016

Keywords:

Marine scientific research
United Nations Convention on the Law of the Sea

Transfer of technology

Pacific region

Sustainable Development Goals

Blue Economy

ABSTRACT

Promoting the study of the marine environment is one of the objectives of the United Nations Convention on the Law of the Sea (UNCLOS or the Convention), which constitutes the first comprehensive multilateral agreement covering all ocean spaces and embodying the concept of sustainable development by addressing all dimensions of ocean uses, including environmental, economic and social. At the core of the provisions of UNCLOS related to marine scientific research (MSR) lie the promotion of such research, international cooperation and the creation of favourable conditions for the conduct of MSR, as well as the publication and dissemination of information and knowledge resulting from such research.

For Pacific Small Island Developing States (PSIDS), the ability to undertake and benefit from MSR and access appropriate technology represents a unique opportunity to contribute significantly to their sustainable development aspirations. However, many challenges remain for PSIDS to fully benefit from MSR and the opportunities associated with the development of a 'Blue Economy'. This article reviews the challenges and opportunities for PSIDS arising from MSR, including with regard to the implementation of the relevant provisions of UNCLOS.

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1. Introduction

"The age of ocean discovery is not yet over (...) At the same time, marine scientific research has taken on a broader meaning; it is not only the marine environment itself which is under investigation, but also the complex interaction of the ocean and the global environment (...) Increasingly, we will look to the oceans to answer questions and find solutions to problems generated on land. Many of those solutions will depend upon the pace of development and the value we place on marine scientific research. Without a strong and dependable scientific knowledge base, informed political and economic decisions cannot be made on either environmental or developmental issues [1]."

This is as true today as it was in 1991, when the statement was made. Long overlooked as overly technical and of secondary importance, marine scientific research (MSR) is slowly re-gaining its right of place as a critical underpinning of sustainable development. In recent years, not only have "The future we want" [2], adopted in 2012, and the SIDS Accelerated Modalities of Action (S.A.M.O.A.) Pathway [3], adopted in 2014, supported action related to MSR, but the topic also features prominently as a means of

implementation of Sustainable Development Goal 14 "Conserve and sustainably use the oceans, seas and marine resources for sustainable development" contained in Agenda 2030, adopted in 2015 [4].

Promoting the study of the marine environment is one of the objectives of the United Nations Convention on the Law of the Sea (UNCLOS or the Convention) [5], which constituted the first comprehensive multilateral agreement covering all ocean spaces and addressing all dimensions of ocean uses, including environmental, economic and social. UNCLOS therefore embodied sustainable development before the concept was formally recognised. At the core of the provisions of UNCLOS related to MSR [6], lie the promotion of such research [7], international cooperation and the creation of favourable conditions for the conduct of MSR [8], as well as the publication and dissemination of information and knowledge resulting from such research [9]. The relevant provisions of UNCLOS are the result of compromises between the interests and rights of researching States and coastal States. They also take into account the different levels of MSR-related capacities among States, including by recognising the need to strengthen the autonomous MSR capabilities of developing States [10], and to promote the development and transfer of marine technology [11].

For Pacific Small Island Developing States (PSIDS), the ability to undertake and benefit from MSR and access appropriate technology represents a unique opportunity to contribute significantly to their sustainable development aspirations. However, many challenges remain for PSIDS to fully benefit from MSR.

[☆]The opinions contained in this article are expressed by the authors in their personal capacities and do not reflect the views of the United Nations or SPC.

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Over 20 years after the entry into force of UNCLOS, this article reviews the challenges and opportunities for PSIDS arising from MSR, including with regard to the implementation of the relevant provisions of UNCLOS.

2. The legal framework for marine scientific research under UNCLOS

Part XIII of UNCLOS sets out the legal framework for the conduct of MSR both within and beyond national jurisdiction. Inherently linked to the provisions of Part XIII are those of Part XIV related to the development and transfer of marine technology.

2.1. General overview

Inspired by the long-held principle of freedom of scientific enquiry, the freedom to undertake scientific research in the oceans was set out in a number of ocean-related instruments, long before UNCLOS [12]. During the Third United Nations Conference on the Law of the Sea, some divergent views were expressed on what constituted MSR, including whether it included both fundamental and applied research or only the former [13]. Ultimately, UNCLOS does not include a definition for MSR [14]. However, reference is made in Part XIII, *inter alia*, to the study of the essence of phenomena and processes occurring in the marine environment and the interrelations between them [15], as well as to projects of direct significance for the exploration and exploitation of natural resources, whether living or non-living [16]. The practice of States has shown that the assessment by the coastal State of a given MSR project is what, in practice, defines its nature [17].

UNCLOS provides for a number of general principles governing the conduct of MSR. All States, irrespective of their geographical location (i.e., including land-locked and geographically disadvantaged States) [18] and competent international organisations are entitled to conduct MSR subject to the rights and duties of other States [19]. Such research should be exclusively for peaceful purposes, conducted with appropriate scientific methods and means compatible with UNCLOS, should not unjustifiably interfere with other legitimate uses of the sea, must be duly respected in the course of such uses compatible with UNCLOS, and should comply with all relevant regulations adopted in conformity with UNCLOS including those for the protection and preservation of the marine environment [20]. In addition, MSR activities cannot constitute the legal basis for any claim to any part of the marine environment or its resources [21].

International cooperation is a fundamental aspect of MSR. As a result, UNCLOS includes a number of obligations for States and competent international organisations to promote international cooperation in MSR, create favourable conditions for its conduct, promote the flow of scientific data and information and the transfer of knowledge resulting therefrom, especially to developing States, as well as strengthen the MSR capabilities of developing States [22].

It should also be noted that States and competent international organisations are responsible for ensuring that MSR, whether undertaken by them or on their behalf, is conducted in accordance with UNCLOS. They are therefore responsible and liable for the measures they take in contravention of the Convention in respect of MSR and must provide compensation for damage resulting from such measures. They are also responsible and liable for damage caused by pollution of the marine environment arising out of MSR undertaken by them or on their behalf [23].

MSR and marine technology [24] are interlinked as the former cannot take place without the latter and because new scientific discoveries from the marine environment can contribute to

technological developments. However, although marine technology is an essential underpinning of MSR, the transfer of marine technology is not among the conditions for researching States to comply with in the conduct of MSR [25]. UNCLOS nevertheless recognises the importance of the development and transfer of marine technology in its Part XIV. It is, however, generally recognised that Part XIV has suffered from an implementation gap. As a result, the outcomes of several international conferences on sustainable development, including “The future we want” [26], the SAMOA Pathway [27] and the 2030 Agenda for Sustainable Development [28], have reaffirmed the importance of enabling the development of marine scientific and technological capacity and promoting the transfer of marine technology, including with a view to “accelerating the social and economic development of developing States” [29].

2.2. Marine scientific research within national jurisdiction

The undertaking of MSR within national jurisdiction follows a gradient of rights and obligations depending on the maritime zone within which the research is to be carried out: the closer to the coast, the more extensive are the rights of the coastal State. This highlights the critical need for coastal States to know the precise limits of the various zones in which the research is to take place.

In the exercise of their sovereignty over the internal waters [30], archipelagic waters [31] and territorial sea [32], including the seabed and subsoil [33], coastal States enjoy full discretion and have the exclusive right to regulate, authorise and conduct MSR. As a result, the express consent of the coastal State is required to undertake MSR in these zones, which can only be conducted therein under the conditions it sets forth [34]. In straits used for international navigation, foreign ships in transit passage, including MSR ships, may not carry out any research activities without the prior authorisation of the States bordering straits [35]. Similar obligations apply to foreign ships in archipelagic sea lanes passage through a State's archipelagic waters (insert ref to UNCLOS art.54).

In the exclusive economic zone (EEZ) [36] and on the continental shelf [37], UNCLOS attempts to balance the freedom of scientific research with the expansion of the sovereign rights of coastal States out to 200 nautical miles by framing their right to conduct, authorise and regulate MSR in two ways. While MSR can only be conducted with the consent of the coastal State [38], such consent is nevertheless expected to be granted, “in normal circumstances” [39], for MSR activities which are to be carried out exclusively for peaceful purposes and in order to increase scientific knowledge of the marine environment for the benefit of all mankind [40]. In addition, UNCLOS requires the coastal State to adopt reasonable rules, regulations and procedures to promote and facilitate MSR [41], and to establish rules and procedures to ensure that the consent will not be delayed or denied unreasonably [42]. In practice, not all States have adopted the required rules, regulations and procedures. Where they exist, these rules, regulations and procedures sometimes simply replicate the provisions of UNCLOS without providing additional guidance on the form of the request for consent, specific competent authority for processing the request, timing of the request, conditions attached to the consent, etc [43]. The resulting legal and procedural uncertainty seems to have presented difficulties for researching States, sometimes impeding the research to the detriment of both researching and coastal States [44].

There are a number of cases in which a coastal State may withhold its consent to MSR in its EEZ and on its continental shelf [45], such as those in which the project is of direct significance for the exploration and exploitation of natural resources, whether living or non-living [46]; involves drilling into the continental shelf, the use of explosives or the introduction of harmful

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