

Marine Scientific Research: Taking Stock and Looking Ahead

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1 Introduction

Since the Challenger expedition in the 1870s, which is considered as the advent of modern oceanography,¹ marine scientific research (hereafter MSR) has considerably evolved. New methods of research covering a wide area of scientific interest such as biology, chemistry, geology, and geophysics, as well as advanced technology stemming from simple techniques (dredging, sediment coring, towing of platforms carrying video recorders, and echo sounding traverses) to very sophisticated and extremely expensive ones (such as remotely operated vehicles, known as ROVs, capable of diving to great depths to carry out research and retrieve samples from the deep sea) have been put forward in order to enhance our knowledge on the marine environment.² This scientific (r)evolution has inevitably increased the interest of the coastal States in the potential economic exploitation of their offshore resources and has consequently grown their appetite for further expanding their jurisdiction in the oceans.

While scientific understanding of the role of the oceans has considerably progressed since the nineteenth century, we still know very little of this huge, abyssal, and often inaccessible, natural asset. Although oceans represent a very

¹The Challenger expedition, led by British naturalist John Murray and Scottish naturalist Charles Wyville Thompson between 1872 and 1876, is considered to be the first true oceanographic expedition organized to gather data on a wide range of ocean features, including ocean temperatures, currents, marine life and geology of the seafloor.

²For brief general background information on the nature of MSR conducted in the oceans see Leary (2007), pp. 183–188.

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essential part of our planet, paradoxically they are the least known and thus the least understood geographical and geomorphological areas. As one commentator has, quite eloquently, noticed: “until quite recently we did not know what was at the bottom of the oceans. Nor did we know what the bottom of the ocean was made of. In most areas, we did not even know where the bottom of the ocean actually was.”³ This is actually the case not only for the deep sea, where only 8% has been explored and mapped to this date, but also for smaller and more crowded marine areas such as the Mediterranean. For instance, general information on deep-sea resources and issues of biosecurity in this marine region is still missing. Furthermore, there is lack of marine habitat maps and information on small-scale fisheries, as well as a complete inventory of the biodiversity.

Consequently, there is a strong need to develop further knowledge of the marine environment. The interest, however, does not only lie in knowing and better understanding what actually occupies their hidden realm. A better knowledge of the marine environment could also have important practical applications. It could, for instance, grow the capacity of coastal States to combat climate change and respond to increasing anthropogenic pollution or promote sustainable policies and management of their resources, mineral or biological, not to mention the role that some potentially valuable biological resources of the seabed, yet unexplored, may play in the future.

However, this need to develop further knowledge of the marine environment is being restricted by rules of law. The seas and oceans of the world consist of a complex mosaic of different maritime zones, where different legal regimes apply. To enter these waters, researchers, being a State, an international organization, or a private institution, should—in some cases—request and obtain the authorization to do so by following several procedures from different administrative services. So the first question that arises is what potential controls could be held on research projects. In other words, how is MSR regulated? Is the applicable legal framework suitable for the current emergent needs? Does it encourage or not the conduct and promotion of marine scientific research?

This chapter critically explores the international legal regime, which operates to regulate marine scientific research. The first part outlines the general characteristics of this regime. It begins with a brief legislative history to illustrate the factors that have influenced the shape of the current legal framework. It then gives a brief overview of the current regime (Sect. 2). The second part then goes on to consider implementation concerns, as well as some unsettled questions that could lead to potential confusion when the regime is being interpreted and applied in practice (Sect. 3). It concludes with some general remarks regarding how marine scientific research can be more effective, a factor of great importance in combatting global ocean threats (Sect. 4).

³See Leary (2007), p. 8.

2 The MSR Legal Regime

2.1 *From Geneva to Montego Bay: A Brief Legislative History*

The regulation of MSR is a relative newcomer to the law of the sea. Until the 1950s, it was not perceived as necessary. MSR has been conducted more or less freely on the high seas.⁴ However, the gradual expansion of national jurisdictions on the continental shelf and the recognition of the increasing importance of its resources led to calls for the development of the legal framework in this area. Several coastal States wanted to protect their freshly accorded rights from potential unwanted researchers.

The first attempt to develop MSR regulation arose during the first UN Conference on the Law of the Sea in 1958. However, among the four Conventions adopted,⁵ only the Convention on the Continental Shelf contained a few provisions on MSR. In its article 5, it recognized to the coastal State sovereign and exclusive rights for the purpose of exploring its continental shelf and exploiting its natural resources. Any research concerning the continental shelf was subject to limited control by the coastal State, especially where MSR might infringe upon these rights.⁶ Therefore, a distinction concerning the nature of the research activities between fundamental (undertaken only for scientific purposes carried out with the intention of open publication) and applied (resource-related) research was embodied in the relevant provisions.⁷ Research activities qualified as fundamental would normally be conducted without restrictions, while those qualified as applied research were subject to the coastal States' consent.

MSR was specifically addressed neither in the case of the territorial sea nor in the case of the high seas. Regulation within the territorial sea was considered to be an act of sovereignty and, thus, under exclusive control of the coastal State. In other words, any MSR conducted by foreign States should be subject to a coastal State's

⁴See Treves (2012), para. 5.

⁵The Convention on the High Seas, the Convention on the Territorial Sea and Contiguous Zone, the Convention on the Continental Shelf and the Convention on Fishing and Conservation of the Living Resources of the High Seas.

⁶According to article 5 (8): "*the consent of the coastal State shall be obtained in respect of any research concerning the continental shelf and undertaken there. Nevertheless the coastal State shall not normally withhold its consent if the request is submitted by a qualified institution with a view to pure 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*".

⁷For a general discussion see Caffisch and Piccard (1978), pp. 848–852.

consent.⁸ Within the high seas, although MSR was not expressly listed as a freedom, it was generally accepted as such.⁹

Thus, the legal framework set forth in Geneva would result in a simultaneous application of a different regime in the same maritime space. Whereas MSR on continental shelf was subject to the consent of the coastal State, it was nevertheless free when conducted on the superjacent waters (waters above), belonging to the high seas.

All these elements would form the basis of a more detailed MSR regime, adopted a few years later in Montego Bay within the framework of the United Nations Convention on the Law of the Sea (hereafter UNCLOS). However, the way was not paved with nenuphars. During the negotiations, held from 1973 to 1982, MSR regulation proved to be one of the most delicate and difficult issues to resolve.¹⁰ The major researching (and, of course, mostly developed and having the necessary funding) States crossed swords with the newly independent and developing coastal States on a number of conflicting issues: the distinction between fundamental or pure and applied research; the extent of the coastal States' control over MSR, especially in the emerging exclusive economic zone (hereafter EEZ); and dispute settlement.¹¹ Both sides put forward claims and arguments. Researching States claimed a liberal regime for MSR, without restrictions, and open publication of the results of benefit to all. On the other hand, coastal States had a special interest in research activities conducted within waters under their jurisdiction. Several (mostly developing) States strongly believed (rather understandably) that an unlimited right to conduct MSR would lead to abuses on the part of the researching States because it would inevitably have some direct or indirect bearing on their natural resources or might serve as a disguise for other operations related to the exploration and exploitation of natural resources or even intelligence gathering activities.¹² Some countries called for the establishment of an international body responsible for regulating MSR in all marine areas.¹³

While these arguments and proposals were not entirely convincing, it was nevertheless clear that some balance should be found between conflicting interests: the interest of researchers in facilitating the conduct and promotion of MSR and the interests of the coastal States in protecting their rights within the waters under their jurisdiction. Thus, the final result incorporated in UNCLOS, signed in Montego Bay in 1982, was a product of compromise trying to accommodate concerns stemming from both sides.

⁸For further analysis see Stephens and Rothwell (2015), p. 563.

⁹Leary (2007), p. 191.

¹⁰For a brief description see de Marffy (1985).

¹¹UN, DOALOS (hereafter: DOALOS Guide) (2010), p. 3.

¹²See Caffisch and Piccard (1978), p. 850.

¹³For a brief description of these proposals see Leary (2007), pp. 191–193.

2.2 *Current Regime Under UNCLOS: Consent v. Freedom*

The 1982 UNCLOS compensated the prior indigence by devoting an entire part, consisting of 28 articles, to the subject of marine scientific research. Part XIII (articles 238–265) describes in detail the legal framework within which all research activities must be carried out in order to “promote the study of the marine environment,” proclaimed in the preamble of the Convention.

A simple lecture on the first articles gives the impression of a rather liberal regime. The general rule is that all States, coastal or not, have the right to conduct MSR subject to rights and duties of other States.¹⁴ The same right to conduct MSR is recognized in competent international organizations, i.e. organizations with competence in marine science, such as the International Seabed Authority or the UNESCO International Oceanographic Commission. The right to conduct MSR is directly associated with the obligation to promote and facilitate MSR,¹⁵ which has been convincingly described as a “principle of positive engagement” for the purpose of increasing knowledge for the benefit of all mankind on what is its major natural environment: the ocean.¹⁶

Nevertheless, the general right to conduct MSR is not an absolute one as it is restrained by subsequent principles and rules. Some of them are justified by the due respect to other international rules or legitimate uses of the sea. Thus, marine scientific research shall be conducted exclusively for peaceful purposes, with appropriate scientific methods and means compatible with the Convention and in conformity with regulations under the Convention,¹⁷ including those for the protection and preservation of the marine environment.¹⁸ The issue of liability is also addressed in these general provisions, providing that researching States or international organizations shall be responsible and liable for damage resulting from measures taken in contravention to the UNCLOS¹⁹ regime and for pollution arising from MSR.²⁰

Other principles and rules, though not unjustified, seem to complicate the applicable regime, and their implementation in practice might create great confusion to researchers when preparing, planning, and conducting a research project. The need to balance the interests of the researching States and the interests of the coastal States resulted in an area-by-area approach to rights in connection with MSR. Thus, the rules vary in accordance to the legal status of the marine areas in which the research is being conducted. The general idea concerning MSR is that the closer to the shore of a coastal State, the greater its consent powers to control the research activities.

¹⁴Article 238.

¹⁵Article 239.

¹⁶See Pancraccio (2010), p. 377.

¹⁷Article 240.

¹⁸For further analysis see Kirk (2015).

¹⁹Article 263 (2).

²⁰Article 263 (3).

Therefore, within the territorial sea, the coastal State, being a full sovereign, has complete control over marine scientific research activities.²¹ It has the exclusive right to regulate, authorize, and conduct MSR. This jurisdiction is not even limited by the right of innocent passage as it is expressly provided that conducting MSR during passage through territorial waters renders a passage noninnocent.²² Consequently, all research activities within the territorial sea require the coastal State's express consent through diplomatic channels.

UNCLOS extended the MSR regulation to the emerging EEZ. However, the regime governing MSR both in the EEZ and on the continental shelf is more complicated than the one governing the territorial sea because the coastal State's consent is subject to conditions.²³ Within these maritime zones, the coastal State has both jurisdiction over MSR and the right to regulate, authorize, and conduct research activities. Its consent for MSR activities conducted by third States or international organizations is also required. However, in this case, the coastal State does not have an unlimited discretion to withhold such consent. It can do so only in four cases, expressly enumerated in the Convention, that concern projects (a) of direct significance for the exploration and exploitation of natural resources, whether living or nonliving; (b) that involve drilling into the continental shelf; (c) that involve construction, operation, or use of artificial islands; and (d) that contain incorrect information provided to the coastal State or if the researching State or competent international organization has outstanding obligations to the coastal State from a prior research project.²⁴ The coastal State is given further guarantees as it has the right to require the suspension of cessation of any MSR activities if they are not conducted under the conditions set forth in Part XIII of UNCLOS.²⁵

However, the consent has to be granted in normal circumstances,²⁶ provided that the research activities are carried out for peaceful purposes and undertaken in order to increase the knowledge of the marine environment for the benefit of mankind. The consent must be explicit, except for two cases in which the Convention provides the possibility of a presumed²⁷ and an implied²⁸ consent, under specific conditions. However, these two possibilities have been ignored by State practice.

²¹ Article 245.

²² Article 19 (2).

²³ Article 246.

²⁴ Article 246 (5).

²⁵ Article 253.

²⁶ Article 246 (3).

²⁷ According to article 247, the consent of the coastal State is presumed if that state is a member of or has a bilateral agreement with an international organization that aims at conducting MSR, by itself or under its auspices, in the EEZ or on the continental shelf of the coastal State, and further provided that the coastal State either explicitly approved the project when the decision was initially made or the coastal State did not object to the decision within a period of 4 months after notification.

²⁸ According to article 252 the consent of the coastal State is implied provided that it has not reacted within a period of 4 months after the required information has been provided by the researching State or the competent international organization.

This constant give and take of guarantees between researching and coastal States attests the difficulties in balancing the conflicting interests of both sides. Coastal developing States feared that freedom of scientific research would increase inequalities between the rich and the poor. Thus, marine scientific activities should be controlled as much as possible. Consequently, researchers also have procedural obligations to follow not only before undertaking a research activity (to provide the coastal State with all necessary information at least 6 months before the starting date of the research activities)²⁹ but also after having been granted consent to conduct MSR. This is to ensure the right of the coastal State to participate, if it so desires, in the research project and to give the coastal State access to data and information about any major changes in the project.³⁰

There is also a provision concerning the continental shelf beyond 200 miles, according to which coastal States may not withhold consent to foreign researchers to conduct MSR, unless it is for specific areas publicly designated by those States as areas in which exploitation or exploration operations are occurring or will occur within a reasonable period of time.³¹ It should be noted that the water column above the outer continental shelf belongs to the high seas, where MSR is freely conducted.

In the maritime zones beyond national jurisdiction—in the deep seabed, that is the area beyond the continental shelf called “the Area,” as well as in the high seas—MSR may be conducted by all States with due regard for other rules under the Convention, such as the duty to protect the marine environment.³² In the high seas, MSR has been expressly accorded the status of a high sea freedom.³³ Thus, in this case, only the flag State of the ship conducting research activities has jurisdiction.

These provisions raise some remarks that are worth noting. The first is that the balance seems to weigh more on the side of the coastal States, whose sovereign rights have undoubtedly been reinforced. The extension of the MSR regime to EEZs and the upgrading of the coastal State’s consent powers have restrained freedom of scientific activities in larger areas of the sea at the expense of scientific research. However, and this is the second remark, the consent regime applicable to the EEZ and on the continental shelf is not absolutely clear. For instance, the provisions related to the procedural obligations of the researchers are subject to different interpretations or even controversy.³⁴ What are the limits in the coastal State’s right to participate, if it desires so, in the research project? Which are the appropriate official channels for the communication of MSR projects? Who assesses the data required prior or during the research activities? Which decisions

²⁹Article 248.

³⁰Article 249.

³¹Article 246 (6).

³²Articles 256 and 257.

³³Articles 87 and 257.

³⁴See Jarmache (2003).

of the coastal State are justiciable?³⁵ Arguably, the rights of the researchers are not well defined, and this ambiguity may delay or even discourage potential research projects.³⁶

3 From Theory to Practice: Implementing the MSR Regime

MSR is regulated by the relevant provisions of the 1982 UNCLOS, which actually counts 167 contracting parties, including the EU.³⁷ It is worth noting that only few coastal States have enacted special national legislation to prescribe procedures necessary for conducting MSR, but overall it seems that their practice is more or less consistent with the UNCLOS requirements.³⁸ Moreover, the almost universal acceptance of the Convention and the influence of its Part XIII on State practice indicate that many of the MSR provisions reflect customary international law and, thus, are applicable to all users of the oceans.³⁹ Other legal instruments, either universal or regional, complement the general framework by encouraging State parties to cooperate for the promotion of MSR.⁴⁰

Obviously, international law offers a general framework for conducting and promoting MSR. The question concerns how this regime is applied in practice and if it is effective. There are three components related to the practical implementation of the MSR legal framework. The first concerns its spatial dimension, while the second refers to its functional application. The third component relates to who is involved.

3.1 *Where? The Spatial Dimension*

In many parts of the world, maritime zone maps are not yet completely drawn as there are still pending disputes, open issues, or even “unfinished business”⁴¹

³⁵Under article 297 (2), the coastal State denying consent or ordering the suspension or cessation of MSR in its EEZ or on the continental shelf is not obliged to subject itself to the dispute resolution settlement. For further analysis see Roach (1996).

³⁶For further discussion concerning the difficulties for foreign researchers to obtain an approval permit see Xue (2009), p. 215.

³⁷http://www.un.org/Depts/los/reference_files/chronological_lists_of_ratifications.htm. Accessed: 9 Mar 2016.

³⁸For a review of the State practice see the site of the Intergovernmental Oceanographic Commission of UNESCO, <http://www.ioc-unesco.org>. Accessed: 9 Mar 2016.

³⁹However, this is not the case for some provisions, such as the one referring to the possibility of implied consent, which is ignored in State practice, see Treves (2012), par. 16 and 17.

⁴⁰Article 13.

⁴¹This expression is mentioned by Gavouneli referring to the Agreement concluded in 2009 between Greece and Albania, which was declared as unconstitutional by the Albanian Constitutional Court, Gavouneli (2015), p. 276.

(e.g., agreements concluded but not yet in force). Obviously, this situation affects the conduct and promotion of MSR activities and is not so encouraging for potential researchers. From which coastal State are they going to request permission to undertake a research in disputed areas?

A very characteristic example is the Adriatic and the contiguous Ionian seas. This maritime region links seven countries: Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Albania, and Greece. A particular feature of this marine region is that many coastal States have not claimed all maritime zones that they are entitled to establish under international law.⁴² The result is that large areas of the Adriatic and Ionian marine regions remain beyond the jurisdiction of coastal States and under the regime of the high seas.

In fact, the current jurisdictional picture is rather complex.⁴³ All coastal States have established a 12 nm territorial sea, with the exception of Greece, which maintains a 6 nm territorial sea, and Bosnia and Herzegovina, a special case due to its particular geographic situation.⁴⁴ Within this zone, coastal States have exclusive control over MSR activities, and their express consent is required.

The coastal states also have jurisdiction on the continental shelf, where they exercise substantial control over MSR activities. This zone does not need to be proclaimed as it exists *ab initio* and *ipso facto*, but the narrow sea space does not permit them to enjoy the maximum jurisdictional rights permitted under international law. However, the relative maritime boundaries have not been yet fully established.⁴⁵ With the exception of three delimitation agreements in force (the 1968 agreement between Italy and former Yugoslavia, the 1977 agreement between Italy and Greece, and the 1992 agreement between Italy and Albania), the rest of the maritime boundaries remain to be agreed upon, including some territorial sea boundaries. This includes, for example, the southern boundary of the Slovenian territorial sea with Croatia, as the dispute is currently being subjected

⁴²For an explanation see Vidas (2008), pp. 9–10.

⁴³A list of the relevant national legislation is provided in the website of DOALOS, <http://www.un.org/Depts/los/LEGISLATIONANDTREATIES/europe.htm>. Accessed: 2 Oct 2015.

⁴⁴Bosnia and Herzegovina has actually a very limited coastline on the Adriatic Sea, the Neum corridor, which is enclosed between two parts of the Croatian coastline. It could be said that it is an almost landlocked country.

⁴⁵It is worth noting that some States, including Greece and Italy, provide in national legislations that in the absence of delimitation agreements the medial line will apply provisionally. For Greece, see art. 156, Law No. 4001/2011 for the Operation of Electricity and Gas Energy Markets, for Exploration, Production and transmission of networks of Hydrocarbons and other provisions, published in the Government Gazette No. 179, Part One, 22 August 2011, text available at: <http://www.ypeka.gr/LinkClick.aspx?fileticket=l3TNzx1rKsM%3D&tabid=765&language=en-US>. Accessed: 9 Mar 2016. For Italy, see art. 1 (3), Legge No. 61 di 8 febbraio 2006, *Istituzione di Zone di Protezione Ecologica Oltre il Limite Esterno del Mare Territoriale*, Gazzetta Ufficiale No. 52 del 3 marzo 2006, text available at: <http://www.camera.it/parlam/leggi/060611.htm>. Accessed: 9 Mar 2016.

to arbitration,⁴⁶ not to mention the maritime boundaries between Greece and Albania. In 2009, after lengthy negotiations, the two States signed a continental shelf delimitation agreement with a built-in mechanism for automatic extension to any future maritime zones that might be proclaimed. However, a year later, the Albanian Constitutional Court declared—rather unconvincingly⁴⁷—the agreement as unconstitutional.

Undoubtedly, the list of problems is endless. In 2003, Croatia proclaimed an ecological and fisheries protection zone⁴⁸ on the water column above its continental shelf. Although this zone is not mentioned in UNCLOS, its establishment derives from the rights of coastal States to claim an EEZ, and thus the legal regime may be identical to the regime of an EEZ. Thus, MSR activities in this zone are subject to the coastal State's consent. Nevertheless, the Croatian act raised strong protests on the part of the neighboring countries, especially Slovenia, which also declared an ecological protection zone with overlapping jurisdiction with the Croatian one.⁴⁹ The dispute has taken not only legal but also political proportions as it was linked to the accession of Croatia to the European Union, and the two countries agreed to follow the route of arbitration. Italy has also declared an ecological protection zone, but it does not apply to the Adriatic and Ionian seas.⁵⁰

There is also another issue of concern. As EEZs have not been proclaimed (with the exception of the derivative zones of Croatia and Slovenia already mentioned), MSR activities on the continental shelf are subject to the consent of the coastal State, whereas they are free when conducted on the superjacent waters, belonging to the high seas. That is why, in practice, several coastal States (including Greece) require either notification or permission on research activities undertaken in the high seas in order to ensure that these activities do not infringe upon their sovereign rights on the seabed.⁵¹ The real question for these States is if there is anything else they can do to ensure that the resources lying on the seabed are treated appropriately.

This jurisdictional picture could change with the establishment of EEZs or even derivative zones, which will reinforce the coastal States' rights to control and

⁴⁶In 2009 the two States signed an agreement to submit their dispute to arbitration. For further information see Territorial and Maritime Arbitration between Croatia and Slovenia, www.pca-cpa.org. Accessed: 9 Mar 2016. For a brief commentary see Cataldi (2013).

⁴⁷According to international law, a State cannot invoke its domestic deficiencies to contest the validity of a duly signed international agreement. For further analysis see Noussia (2010).

⁴⁸Decision on the extension of jurisdiction of the Republic of Croatia in the Adriatic Sea, 53 *Law of the Sea Bulletin*, 2004, pp. 68–69.

⁴⁹Act on the proclamation of the ecological protection zone and on the continental shelf, 60 *Law of the Sea Bulletin*, 2006, pp. 56–57.

⁵⁰Legge No. 61 di 8 febbraio 2006, *Istituzione di Zone di Protezione Ecologica Oltre il Limite Esterno del Mare Territoriale*, Gazzetta Ufficiale No. 52 del 3 marzo 2006, text available at: <http://www.camera.it/parlam/leggi/060611.htm>. Accessed: 5 Nov 2015. For further analysis see Scovazzi (2005).

⁵¹See Strati (2012), p. 50.

benefit from MSR conducted in areas currently belonging to the high seas.⁵² Undoubtedly, the next necessary step should be the delimitation of the maritime boundaries. Although tempting, this scenario is not so desirable. Some coastal States (being also researchers) would rather maintain the current *status quo* because otherwise their rights to conduct free MSR, as well as other activities, up to the limits of the territorial sea of their neighbors will be restricted. Others, although flirting with the idea of proclaiming an EEZ, hesitate to do so; their act could open a Pandora's box, as the example of the dispute between Croatia and Slovenia reveals. Thus, if no exclusive economic zones are proclaimed in these parts of the high seas over the continental shelf under national jurisdictions, problems and concerns relating to the conduct and promotion of MSR will still remain to the detriment of marine scientific activities.

3.2 Which Activities Fall Under MSR? The Functional Dimension

Although many proposals have been discussed during the negotiations,⁵³ UNCLOS does not provide a definition for MSR. Looking back at the *travaux préparatoires*, it seems that the most controversial issue was the difficulty of clearly distinguishing between fundamental and applied research.⁵⁴ Many developing States strongly believed that the acceptance of such a distinction would inevitably lead to abuses. However, the simple rejection of the difference and the submission of both activities to discretionary coastal State consent do not eliminate potential abuses, as several incidents especially in the South China Sea reveal.⁵⁵

A careful reading of the UNCLOS provisions, especially those concerning the conduct of MSR in the EEZ and on the continental shelf, sheds light on an implicit distinction between fundamental and applied research, affecting the discretionary powers of the coastal State to uphold its consent. Even if the precise terms are not explicitly used, it is obvious that the activities where the coastal State should normally grant its consent refer to fundamental research (*projects undertaken exclusively for peaceful purposes and in order to increase scientific knowledge of*

⁵²See the Report prepared for the DG MARE of the European Commission, *Cost and benefits arising from the establishment of maritime zones in the Mediterranean Sea*, June 2013, p. 165, text accessible at: http://ec.europa.eu/maritimeaffairs/documentation/studies/documents/maritime-zones-mediterranean-report_en.pdf. Accessed: 9 Mar 2016.

⁵³DOALOS Guide (2010), pp. 4–5.

⁵⁴DOALOS Guide (2010), p. 5.

⁵⁵For ex. the *Impeccable* incident in the South China Sea, where a USA surveillance ship was conducting undersea passive sonar operations and acoustic data gathering, provoking the reactions of China. For further discussion, see Agnihotri and Agarwal (2009).

the marine environment for the benefit of all mankind). On the other hand, those where consent may be withheld concern applied research (*projects of direct significance for the exploration and exploitation of natural resources, that involve drilling into the continental shelf, etc.*).⁵⁶

However, in practice, it is very difficult to distinguish the two types of activities as no objective criteria have been set forth. The Geneva regime was more effective in that respect as it provided the criterion for open publication of the results in order to make a distinction between the two. Thus, fundamental research is conducted with the intention of open publication of the results, while applied research is undertaken with the intention of producing certain practical results. Certainly, all fundamental research may acquire some practical relevance, but, as Lucius Cafilisch suggested, “this does not mean that such research is undistinguishable from applied research.”⁵⁷ As the same author argues, “even in borderline cases where the planned research is partly fundamental in nature and partly aimed at obtaining practical results,” the requirement of open publication will not be necessarily detrimental to the coastal State’s interests as “it will in fact be the coastal State which will mainly benefit from these results.”⁵⁸ This is because it enjoys exclusive resource jurisdiction over the area in which the research is carried out. Nevertheless, even if MSR is conducted under the watchful eye of the coastal State, the latter might be unwilling to publish the results and UNCLOS gives full discretion in that respect. Coastal States would not be willing to share any information concerning resources lying in maritime zones under national jurisdiction. They will even try to protect from any abusive appropriation those lying in waters outside national jurisdictions.

Yet it can be argued that even if the Convention had incorporated a definition for MSR, it might have been outdated as science and technology evolve quicker than legal regimes. Regardless of how persuasive this argument may be and in line with the position of the negotiators that concluded that a definition would be superfluous,⁵⁹ the lack of a clear definition of marine scientific activities and their means of execution may lead to different interpretations as practice proves.⁶⁰ Therefore, it creates great uncertainty about the activities covered by the MSR regime and those that are not.

There is, indeed, a legal grey zone concerning jurisdiction. For instance, it is not certain if all forms of data collection, routine operational activities, or hydrographical surveys (collection of information for the making of navigational charts and safety of navigation)⁶¹ can be subject to the MSR regime. Some authors

⁵⁶Article 246 (3) and (5).

⁵⁷Cafilisch and Piccard (1978), p. 850.

⁵⁸Cafilisch and Piccard (1978), p. 851.

⁵⁹Bork et al. (2008), p. 303.

⁶⁰Some States limit or enlarge the meaning of the term, according to their own interests. For the American practice, for ex., see Roach (2001), p. 9.

⁶¹See Bateman (2009).

even suggest that activities directed at shipwrecks and other forms of underwater cultural heritage⁶² come within the scope of MSR regime and are, thus, subject to the coastal State consent.⁶³

There is also great controversy as to whether military surveys, which relate to data collection for military purposes, are subject to the MSR regime.⁶⁴ The equipment used for this type of activities is often the same as that used in marine scientific research. Some authors suggest, however, that the intended use of the information collected from such activities by the military would exempt this category from the MSR regime.⁶⁵ On the contrary, others argue that military surveys cannot be distinguished from MSR as the respective motives cannot be easily determined.⁶⁶ They seem to suggest that all marine data collection activities should be covered by the MSR regime; otherwise, they could be carried out in the coastal States' EEZ without any restrictions.

Another important activity, of which the inclusion in the MSR regime is hotly debated, is bioprospecting.⁶⁷ It relates to the access to genetic resources and involves collection and analysis of information, data, or samples aimed at increasing humankind's knowledge of the valuable compounds and genetic materials. The possible commercialization of the results would have "the practical effect of transforming the activity into one that is of direct significance to the exploitation of a natural resource."⁶⁸ It seems that, as in the case of military surveys, it is the intended use of the data collected from such activities, rather than the practical nature of the activities themselves, that distinguishes them from pure scientific research.

Unfortunately, there is no clear answer for all these concerns as there is no definition of MSR activities and the means of their execution.

3.3 Who Is Involved? The Unexplored Duty of Cooperation

MSR is open to all States and their research institutions, as well as competent international organizations. Certainly, the coastal States are the most interested not only in conducting and promoting scientific research but also in ensuring protection of their natural resources and economic interests.

⁶²See Dromgoole (2010).

⁶³*Contra* Roach (1996), p. 60.

⁶⁴See Xue (2009) p. 222 and Bork et al. (2008), p. 305.

⁶⁵See Roach (1996), p. 61.

⁶⁶See Xue (2009), pp. 218–219.

⁶⁷See Jorem and Tvedt (2014).

⁶⁸See Stephens and Rothwell (2015), p. 568.

But the real question is: do the coastal States have adequate means to study and understand by themselves their adjacent marine environment? It seems that capacities in terms of institutions and equipment are very unevenly distributed.⁶⁹ For instance, in the Mediterranean, only a few States have large research vessels able to undertake research in the high seas.⁷⁰ In order to reinforce their research capacity, they might conclude agreements with foreign researchers States.⁷¹ UNCLOS encourages international cooperation in MSR between States and competent international organizations.⁷² These actors are even invited to conclude bilateral or multilateral agreements to create favorable conditions for the conduct of MSR and integrate the efforts of scientists in studying the marine environment.⁷³

Indeed, cooperation is very much needed in a domain such as MSR, which requests considerable investments in human and financial resources. Advantages could be gained from networking and better cooperation between research institutions. In fact, several international research projects do exist. A characteristic example is the “Argo floats” project; launched in 2000, the project boasts an impressive network of data collection *in situ*, covering economic exclusive zones in the Atlantic, the Pacific, and the Indian oceans.⁷⁴ The objective of this project is the continuous monitoring of the temperature, salinity, and velocity of the upper ocean with all data being relayed and made publicly available within hours after collection. However, even these routine operational activities may raise several legal questions that do not receive unanimous answers.⁷⁵

It should also be noted that international cooperation is not always a given. Jurisdictional uncertainty and legal ambiguities may impact the conduct of these

⁶⁹There is no information available in the global level. However, The Global Ocean Science Report, launched in 2014, will provide a tool for mapping and evaluating the human and institutional capacity of States in terms of marine research, observations and data/information management, and provide a global overview of the main fields of interest, technological developments, capacity- building needs and overall trends, as well as information on research investments and the status of ocean research, see Report of the Secretary General, *Oceans and the law of the Sea*, A/70/74/Add. 1, 2015, par. 61.

⁷⁰As far as the Mediterranean is concerned, the Mediterranean Science Commission database provides a list with resources and means of marine research institutions by country around the Mediterranean: <http://www.ciesm.org/online/institutes/IndexInstituts.htm>. Accessed: 9 Mar 2016.

⁷¹This term covers States conducting research themselves or whose private institutions are engaged in such research.

⁷²Article 242.

⁷³Article 243.

⁷⁴For further information see <http://www.argo.net>. Accessed: 14 Mar 2016.

⁷⁵For further analysis see Bork et al. (2008), p. 303.

projects as practice reveals. For instance, in the MEDITS survey program,⁷⁶ the research activities end at the boundary of the ecological and fishery protection zone claimed by Croatia.⁷⁷ Therefore, building mutual confidence is the very first step in launching cooperation for MSR activities.

4 Conclusion

The main objective of this chapter was to show how MSR can be conducted and promoted and to assess the current legal framework provided by UNCLOS. This framework establishes both general obligations and the legal basis for jurisdiction of the coastal States over MSR. Certainly, it does not resolve all problems satisfactorily and does not provide for any technical details. Being a product of a difficult compromise between the interests of the coastal and the researching States, it reflects the tension between appropriation and internationalization, which dominated the negotiations of the universal convention on the law of the sea. However, in the case of MSR, the balance seems to weigh more on the side of the coastal States. As it was eloquently noted: “freedom of MSR has ceased to exist in the law of the sea.”⁷⁸ Admittedly, MSR is not yet free but largely controlled by the coastal States even in some parts of the high seas. This might explain why our knowledge on many issues concerning the role of the oceans is still limited.

This general regime provided by UNCLOS is unlikely to be changed, at least in the nearby future. Nevertheless, it could be further developed and the legal ambiguities clarified by regional cooperation and consistent State practice. Such cooperation could be undertaken by the coastal States themselves or in the framework of competent international organizations or even in the framework of the existing Regional Seas Programme under the auspices of UNEP as it has already been suggested.⁷⁹ Current technological developments in marine scientific research (e.g., remote sensing from satellites or collecting data through other means than ships) and their legal implications could be further discussed in such frameworks, and a code of conduct for MSR activities could be developed to diminish potential controversies. The need for a more integrated approach is more than evident. Instead of a strict balance of interests between coastal and researching States,

⁷⁶The MEDITS survey programme intends to produce basic information on benthic and demersal species in terms of population distribution as well as demographic structure, on the continental shelf and along the upper slopes at a global scale in the Mediterranean sea through systematic bottom trawl surveys. For further information, see <http://www.sibm.it/SITO%20MEDITS/principaleprogramme.htm>. Accessed: 14 Mar 2016.

⁷⁷*Cost and benefits arising from the establishment of maritime zones in the Mediterranean Sea*, *op. cit.*, p. 174.

⁷⁸See de Marffy (1985), p. 957.

⁷⁹See Oral (2014).

wider concerns need to be taken into account, such as issues of sustainability, as well as the necessity to know and better comprehend the marine environment.

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