



Using submarine cables for climate monitoring and disaster warning

## **Opportunities and legal challenges**



IOC



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## Table of contents

Page

<b>1</b>	<b>Introduction and executive summary</b>	<b>1</b>
<b>2</b>	<b>Jurisdiction and the law of the sea</b>	<b>4</b>
2.1	Territorial sea	4
2.2	Right of innocent passage	4
2.3	Contiguous zone	4
2.4	Exclusive economic zone (“EEZ”)	5
2.5	Continental shelf	5
2.6	High seas	5
2.7	The Area	6
<b>3</b>	<b>International legal regime for installation and maintenance of submarine cables</b>	<b>8</b>
<b>4</b>	<b>International legal regime for marine data collection</b>	<b>11</b>
4.1	Marine scientific research	11
4.1.1	«Marine scientific research» undefined	11
4.1.2	Qualified right to conduct marine scientific research	12
4.1.3	Consent requirements	13
4.1.4	Conditions in the EEZ or on the continental shelf	14
4.1.5	Intergovernmental process	15
4.1.6	Equipment and installations	15
4.1.7	Marine scientific research in the Area	16
4.2	Surveys	16
4.2.1	Hydrographic surveys	17
4.2.2	Submarine cable related surveys	17
4.2.3	Military surveys	17
4.3	Exploration and exploitation of marine resources	18
4.4	Operational oceanography	18
<b>5</b>	<b>Preliminary assessment of legal-regulatory considerations</b>	<b>20</b>
5.1	The LOS convention and customary international law do not classify dual purpose telecom-marine data cables definitively as MSR	20

	<i>Page</i>
5.2	Dual purpose telecom-marine data cables are likely to be permitted with few restrictions by some coastal states while treated as MSR by other coastal states ..... 21
5.2.1	Easier case 1: Deployments on the high seas and in the Area ..... 22
5.2.2	Easier case 2: Deployments in the EEZs and continental shelf areas of coastal states that recognize the concept of operational oceanography ..... 22
5.2.3	Easier case 3: Deployments in EEZs and continental shelf areas by domestic entities, regardless of whether activities are classified as operational oceanography or MSR ..... 22
5.2.4	Harder case 1: Coastal state regulates deployment and operation of sensors in EEZs and continental shelf areas as MSR ..... 23
5.2.5	Harder case 2: Coastal state regulates entire cable as MSR on theory that sensors anywhere deployed “taint” the entire cable ..... 24
5.3	The potential for erosion of submarine cable rights and freedom ..... 24
5.4	A way forward ..... 25
<b>Glossary .....26</b>	
<b>Bibliography .....27</b>	

# Using submarine cables for climate monitoring and disaster warning

## Opportunities and legal challenges

### 1 Introduction and executive summary

Traditionally, the commercial telecommunications and scientific applications of submarine fiber-optic cables have operated independently of each other. Submarine cables carry an overwhelming – and growing – percentage of the world’s voice, data, and Internet traffic.<sup>1</sup> Scientists also operate submarine cables to power, and transmit data from, marine observatories, in some cases using retired submarine cables previously used for commercial telecommunications.<sup>2</sup> Recent technological developments and scientific imperatives have generated significant interest in multipurpose submarine cables that would transport commercial telecommunications traffic while also gathering and transmitting real-time data regarding ocean temperature, salinity, and water pressure by using scientific sensors.<sup>3</sup> In this paper, I will refer to such dual-purpose submarine cables with telecommunications and marine data collection capabilities as “telecom-marine data cables.”

First, demand for marine data continues to grow. Aware of the limits of existing methods and instruments for collecting marine data,<sup>4</sup> policymakers and scientists continue to seek more, and more reliable, data regarding ocean conditions and climate change.<sup>5</sup> They also seek new and better data regarding natural disasters, particularly in the wake of the Asian tsunami resulting from the 2004 Sumatra-Andaman earthquake and more recently the east Japan tsunami resulting from the 2011 Tohoku earthquake.<sup>6</sup>

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<sup>1</sup> See *Submarine Cables and the Oceans – Connecting the World*, UNEP-WCMC Biodiversity Series No. 31 (UNEP-WCMC and ICPC, 2009) at 8 (noting that more than 95 percent of the world’s telecommunications and Internet traffic is routed via submarine cable).

<sup>2</sup> See *id.* at 51-53 (describing underwater observatories); Yuichi Shirasaki et al., *Study on ocean observatories by re-use of retired optical submarine cable*, Oceans ’04 MTS-IEEE Techno-Ocean 2004 Conference Proceedings (14 March 2005), vol. 4 at 2170; “Old Phone Cables Open Seabed to Science,” *The New York Times* (24 Aug. 1999).

<sup>3</sup> *Call to Action*, Workshop on **Submarine Cables for Ocean/Climate Monitoring and Disaster Warning: Science, Engineering, Business and Law** (Rome, 9 Sept. 2011), [www.itu.int/dms\\_pub/itu-t/oth/4B/04/T4B040000080001MSWE.docx](http://www.itu.int/dms_pub/itu-t/oth/4B/04/T4B040000080001MSWE.docx).

<sup>4</sup> Marine data is presently collected using a wide variety of methods and devices. These include: remote devices (which may be deployed from ships or from land), such as cabled observatories, buoys (whether moored or drifting), remotely-operated vehicles, balloons, floats, and expendable bathythermographs; equipment on civilian and military ships and aircraft; and satellites.

<sup>5</sup> See, e.g., Georgeanne Purvinis et al., *Global Deep Ocean Sensor Network on Submarine Cables*, Oceans ’08 MTS/IEEE Kobe Techno Ocean Conference Proceedings (28 May 2008); Yuzhu You, *Using Submarine Communications Networks to Monitor the Climate Change*, ITU Technology Watch Report (Nov. 2010) (“You”) at 4; Peter Ryder, *A possible migration from marine scientific research to operational oceanography in the context of the United Nations Convention on the Law of the Sea in BUILDING THE EUROPEAN CAPACITY IN OPERATIONAL OCEANOGRAPHY, PROCEEDINGS OF THE THIRD INTERNATIONAL CONFERENCE ON EUROGOOS* (H. Dahlin et al. eds., Elsevier B.V., 2003), at 25 (“Ryder”).

<sup>6</sup> *Id.*

Second, the relevant technologies have evolved. Suppliers of submarine cable systems have developed new technologies and systems to enable multi-use or hybrid submarine cable systems combining commercial telecommunications and scientific functions.<sup>7</sup> Scientists have also developed methods for using existing and retired submarine cables for data collection.<sup>8</sup>

Nevertheless, such multipurpose cables do not always fit neatly within the jurisdictional categories established in international law.<sup>9</sup> The United Nations Convention on the Law of the Sea (“LOS Convention”),<sup>10</sup> other treaties and customary international law establish a sliding scale of jurisdictional rights for coastal states, with the rights generally declining as the distance from the coast increases: the territorial sea; the contiguous zone; the exclusive economic zone (“EEZ”); the continental shelf; the high seas; and the seabed and ocean floor, and subsoil thereof, beyond the limits of national jurisdiction. The international legal regimes for submarine cables and marine data collection treat submarine telecommunications cables and marine data collection as discrete activities, with defined legal rights and obligations.

Submarine cables are permitted freedoms and protections accorded to no other marine activity. International law recognizes unique freedoms for the installation and maintenance of submarine cables. Various international treaties dating back to 1884 guarantee unique freedoms to lay, maintain, and repair submarine cables – freedoms not granted for any other marine activities – and restrict the ability of coastal states to regulate them. Principles articulated in these treaties have since been recognized as customary international law.

By contrast, certain types of marine data collection are subject to varying levels of national jurisdiction and regulation, with marine scientific research subject to significant national jurisdiction and regulation. The LOS Convention recognizes three separate categories of marine data collection: marine scientific research (“MSR”); surveys; and exploration and exploitation of living and non-living resources. To encourage the advancement of science and the peaceful dissemination of information, some states have distinguished a fourth category of marine data collection – operational oceanography – though the concept and its consequences remain hotly disputed.

This paper examines the legal considerations arising from dual-purpose telecom-marine data cables. In assessing these considerations, the reader should keep in mind that the concept of such a dual-purpose cable – including the technology, potential business cases, and legal-regulatory treatment – is still at an early stage. As with many technological and commercial innovations, the dual-purpose telecom-marine data cable does not fit neatly within certain existing legal-regulatory regimes. Nevertheless, the newness of telecom-marine data cables and the complexities of the relevant legal-regulatory regimes are not, by themselves, reasons for declining to pursue any deployment and operation of such cables, particularly in jurisdictions or marine zones where deployment or operation raises few legal or regulatory issues.

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<sup>7</sup> See, e.g., Maurice E. Kordahi, *New Tools for Multilayered Undersea Telecommunication Networks*, SEA TECHNOLOGY MAGAZINE 51, No. 7 (2010) (“In the past, undersea cable networks focused on data transmission between land masses. As the need for better communications and data transfer evolves, however, networks are being envisioned that can go beyond single-purpose fiber and power management, incorporating layers of various individual networks supported by a single infrastructure. A cable that once transmitted only telecommunications data between continents could also relay data from various oil and gas platforms or from a scientific research institute’s underwater observatory.”).

<sup>8</sup> See e.g., You at 3-4.

<sup>9</sup> See Aurora Mateos and Montserrat Gorina-Ysern, *Climate Change and Guidelines for Argo Profiling Float Deployment on the High Seas*, ASIL INSIGHT, Vol. 14, No. 8 (8 Apr. 2010) (“Mateos and Gornia-Ysern”) (noting that “In the conduct of oceanic research activities with new technologies, instruments, and equipment, a fierce resistance to legal regulation of the high seas coexists in an uneasy compromise with a fierce protection of coastal States’ sovereign rights to explore and exploit the natural resources of the continental shelf and the Exclusive Economic Zone (EEZ).”).

<sup>10</sup> United Nations Law of the Sea Convention, Dec. 10, 1982, 1833 U.N.T.S. 397 (entered into force on Nov. 16, 1994) (“LOS Convention”).

The LOS Convention and customary international law do not classify dual-purpose telecom-marine data cables definitively as MSR. Although some government representatives and commentators have asserted otherwise, the text of the LOS Convention itself does not support the conclusion that dual-purpose telecom-marine data cables are MSR by definition. To the contrary, in fact, since the earliest negotiations over the LOS Convention, coastal states have disputed the scope and meaning of the term “marine scientific research”. Customary international law also does not support the treatment of dual-purpose telecom-marine data cables as MSR. The position that such cables are MSR satisfies neither of the requirements of the classical definition of customary international law: general practice and acceptance of general practice as law.

In the absence of agreed treaty interpretations or customary international law governing dual-purpose telecom-marine data cables, there is likely to be variation and experimentation by coastal states and cable owners for the foreseeable future. To understand the opportunities and challenges for such cables, the submarine cable industry and scientists should consider that legal-regulatory circumstances create “easier cases” (deployments on the high seas and where coastal states recognize the concept of “operational oceanography”) and harder cases (deployments within the exclusive economic zone and continental shelf-areas of certain coastal states with an expansive view of MSR and indeed marine jurisdiction generally).

The undersea cable industry and some governments are rightly concerned about guarding against erosion of the unique rights and freedoms accorded to submarine cables. Fundamentally, these parties are concerned both that the dual use telecom-marine data cables would encourage even more aggressive jurisdictional assertions over submarine cables, which, if widespread, could provide a basis for new treaty interpretations or customary international law. Such actions by coastal states could impose significant costs and delays on the installation and maintenance of submarine cables and – particularly in the maintenance context – threaten the reliability of communications transported by such cables.

In the near term, the deployment and operation of telecom-marine data cables is most likely to occur in circumstances such as the “easier cases”, where the risks of MSR regulation and erosion of submarine-cable freedoms are least likely to occur. Continuing disagreements regarding coastal-state jurisdiction over marine data collection makes the prospect of international agreements and standards in this area very unlikely. Moreover, any attempt to impose on submarine cable operators a uniform global approach regarding scientific sensors – if such an approach were even possible – would likely doom the deployment of such cables. For the deployment of telecom-marine data cables to succeed, submarine cable operators and suppliers must determine whether they have sufficient legal-regulatory flexibility and a business case for such deployments.

## 2 Jurisdiction and the law of the sea

All coastal states claim to exercise rights over marine zones adjacent to their coastlines. These claims are governed by numerous international treaties and customary international law. These treaties – the LOS Convention chief among them – establish a sliding scale of jurisdictional rights for coastal states, with the rights generally declining as the distance from the coast increases: the territorial sea (as modified by the right of innocent passage); the contiguous zone; the exclusive economic zone (“EEZ”); the continental shelf; the high seas; and the seabed and ocean floor, and subsoil thereof, beyond the limits of national jurisdiction.<sup>11</sup>

### 2.1 Territorial sea

A coastal state may claim a territorial sea extending up to 12 nautical miles beyond its land territory or internal waters (or beyond its archipelagic waters, in the case of an archipelago).<sup>12</sup> Within its territorial sea, a coastal state has rights and duties inherent in sovereignty (*e.g.*, reservation of fisheries for nationals and exclusion of foreign vessels from cabotage, *i.e.*, coastal trade), although the coastal state must accord to a foreign-flagged vessel the right of innocent passage. Territorial-sea claims vary from 3 to 200 nautical miles, though a claim of 12 nautical miles is most common among coastal states.<sup>13</sup>

### 2.2 Right of innocent passage

Customary international law has long recognized the right of ships of all states to peaceful or innocent passage through the territorial sea.<sup>14</sup> Codifying that right, the LOS Convention defines innocent passage as passage that is “not prejudicial to the peace, good order or security of the coastal state.”<sup>15</sup> A ship’s passage is not innocent if in the territorial sea it should engage in, among other activities, (1) “any act aimed at collecting information to the prejudice of the defence or security of the coastal State”; (2) “the launching, landing or taking on board of any military device”; (3) “the carrying out of research or survey activities”; and (4) “any other activity not having a direct bearing on passage.”<sup>16</sup> Consequently, the installation or maintenance of a submarine cable by a cable ship, barge, or cable survey vessel would not constitute innocent passage. Notwithstanding the right of innocent passage, a vessel exercising such a right remains subject to local laws and regulations.<sup>17</sup>

### 2.3 Contiguous zone

Consistent with the permissible bases identified by the LOS Convention, a coastal state may claim a contiguous zone extending up to 24 nautical miles beyond its land territory or internal (or archipelagic) waters.<sup>18</sup> Within its contiguous zone, a coastal state may exercise control necessary to “prevent infringement of its customs, fiscal, immigration or sanitary laws and regulations within its territory or territorial sea.”<sup>19</sup>

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<sup>11</sup> Elaborate rules exist for delimiting jurisdictions of opposite or adjacent states, whose jurisdictions would otherwise overlap. *See, e.g.*, LOS Convention, arts. 15 (territorial sea delimitation), 74 (EEZ delimitation), 83 (continental shelf delimitation).

<sup>12</sup> LOS Convention, arts. 3 (defining territorial-sea limits), 46 (defining “archipelagic state” and “archipelago”).

<sup>13</sup> *See* Central Intelligence Agency, *Maritime Claims*, WORLD FACTBOOK, <https://www.cia.gov/library/publications/the-world-factbook/fields/2106.html> (last updated 23 Mar. 2012).

<sup>14</sup> Ian M. Brownlie, *PRINCIPLES OF PUBLIC INTERNATIONAL LAW* (Oxford, 5th ed. 1998) at 191-192 (“Brownlie”); LOS Convention, art. 17.

<sup>15</sup> *Id.*, art. 19(1).

<sup>16</sup> *Id.*, art. 19(2).

<sup>17</sup> *Id.*, art. 25(1).

<sup>18</sup> *Id.*, art. 33(2).

<sup>19</sup> *Id.*, art. 33(1).



## 2.4 Exclusive economic zone (“EEZ”)

A coastal state’s EEZ extends 200 nautical miles beyond its land territory or internal (or archipelagic) waters. Within its EEZ, a coastal state has the right to: explore, exploit, conserve, and manage natural resources; establish artificial islands; installations, and structures; conduct marine scientific research; and protect and preserve the marine environment. EEZ claims form the basis for most marine pollution control regulation by coastal states. Many coastal states have framed their EEZ claims narrowly in terms of fishing rights. A coastal state may exercise its rights within the EEZ subject to freedoms of navigation, overflight, and laying of submarine cables and pipelines. Although the LOS Convention defines EEZ jurisdiction narrowly in relation to natural resources and the environment, it is often construed broadly as a basis for regulating any economic activity within the zone.

## 2.5 Continental shelf

The continental shelf of a coastal state comprises the submerged prolongation of the land territory of the coastal state – the seabed and subsoil of the submarine areas extending beyond its territorial sea to the outer edge of the continental margin (consisting of the seabed and subsoil of the shelf, the slope and the rise), or to a distance of 200 nautical miles where the outer edge of the continental margin does not extend up to that distance.<sup>20</sup> It does not include the deep ocean floor with its oceanic ridges or the subsoil thereof. The Commission on the Limits of the Continental Shelf facilitates implementation of these provisions.<sup>21</sup> A coastal state has the sovereign and exclusive right to explore and exploit natural resources of its continental shelf, regardless of occupation or control of the area.<sup>22</sup> To establish the outer limits of a continental shelf beyond 200 nautical miles, a coastal state party to the LOS Convention must “submit particulars of such limits to the Commission along with supporting scientific and technical data as soon as possible but in any case within 10 years of the entry into force of this Convention for that State.”<sup>23</sup> For a state for which the Convention entered into force before 13 May 1999, this ten-year time period was deemed to have commenced on May 13, 1999.<sup>24</sup> As of September 2011, fifty-seven states had made submissions.<sup>25</sup>

## 2.6 High seas

The high seas consist of the seas outside of internal waters, territorial waters (or archipelagic waters, in the case of an archipelagic state), and EEZs of coastal states.<sup>26</sup> As with outer space and celestial bodies, the high seas are considered *res communis omnium*, or “things common to all,” and are not subject to the sovereignty of any state, apart from general acquiescence that states are bound to refrain from any acts which might adversely affect the use of the high seas by other states or their nationals, including navigational rights.<sup>27</sup>

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<sup>20</sup> *Id.*, art. 76.

<sup>21</sup> *Id.*, art. 76(8); Final Act of the Third United Nations Conference on the Law of the Sea, Annex II – Commission on the Limits of the Continental Shelf (“Annex II”).

<sup>22</sup> LOS Convention, art. 77(1), (3).

<sup>23</sup> Annex II, art. 4.

<sup>24</sup> Decision regarding the date of commencement of the ten-year period for making submissions to the Commission on the Limits of the Continental Shelf set out in article 4 of Annex II to the United Nations Convention on the Law of the Sea, United Nations Convention on the Law of the Sea Meeting of States Parties, SPLOS/72 (29 May 2001), <http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N01/387/64/PDF/N0138764.pdf?OpenElement>.

<sup>25</sup> United Nations Department of Oceans and Law of the Sea, Submissions, through the Secretary-General of the United Nations, to the Commission on the Limits of the Continental Shelf, pursuant to article 76, paragraph 8, of the United Nations Convention on the Law of the Sea of 10 December 1982, [www.un.org/Depts/los/clcs\\_new/commission\\_submissions.htm](http://www.un.org/Depts/los/clcs_new/commission_submissions.htm) (last modified 18 Jan. 2012).

<sup>26</sup> LOS Convention, art. 86.

<sup>27</sup> *See id.*, art. 90.

“The high seas are open to all States, whether coastal or land-locked.”<sup>28</sup> Freedoms of the high seas (for both coastal and landlocked states) include: freedom of navigation; freedom of overflight; freedom to lay submarine cables and pipelines and construct artificial islands and other installations (subject to certain limitations relating to exploration and exploitation of natural resources); freedom of fishing (subject to the conditions in Part VII, Section 2, of the LOS Convention); and freedom of scientific research (subject to Parts VI and XIII of the LOS Convention).<sup>29</sup> Nevertheless, states have asserted jurisdiction on the high seas against aliens for acts affecting the security of the state, based on what is known as the “protective principle” or “security principle.”<sup>30</sup>

## 2.7 The Area

The “Area” consists of “the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction.”<sup>31</sup> “No State shall claim or exercise sovereignty or sovereign rights over any part of the Area or its resources, nor shall any State or natural or juridical person appropriate any part thereof. No such claim or exercise of sovereignty or sovereign rights nor such appropriation shall be recognized.”<sup>32</sup> “Activities in the Area shall . . . be carried out for the benefit of mankind as a whole, irrespective of the geographical location of States, whether coastal or land-locked,”<sup>33</sup> and the Area must be used “exclusively for peaceful purposes by all States.”<sup>34</sup> “Activities in the Area” means “all activities of exploration for, and exploitation of, the resources of the Area.”<sup>35</sup> The International Seabed Authority (“ISA”) regulates the exploration and exploitation of solid, liquid, or gaseous mineral resources in the Area at or beneath the seabed (including polymetallic nodules).<sup>36</sup> The ISA “shall provide for the equitable sharing of financial and other economic benefits derived from activities in the Area through any appropriate mechanism, on a non-discriminatory basis.”<sup>37</sup> The ISA is also tasked with acquiring technology and scientific knowledge relating to activities in the Area and promoting “the transfer to developing States of such technology and scientific knowledge so that all States Parties benefit therefrom.”<sup>38</sup> All of these jurisdictional concepts are summarized graphically in Figure 1 and described below.

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<sup>28</sup> *Id.*, art. 87(1).

<sup>29</sup> *Id.*

<sup>30</sup> See Brownlie at 307.

<sup>31</sup> LOS Convention, art. 1(1)(1).

<sup>32</sup> *Id.*, art. 137(1).

<sup>33</sup> *Id.*, art. 140(1).

<sup>34</sup> *Id.*, art. 141.

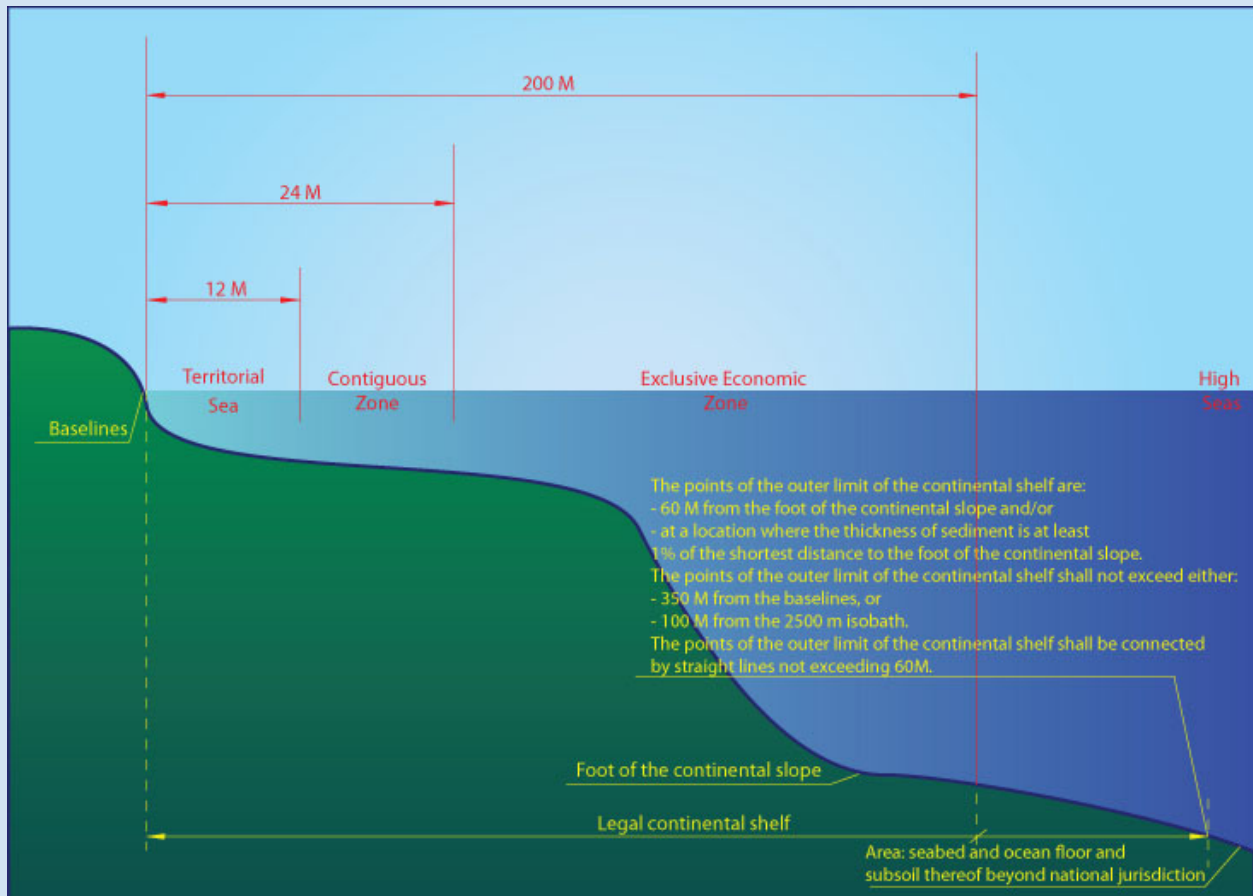
<sup>35</sup> *Id.*, art. 1(1)(3).

<sup>36</sup> LOS Convention, arts. 133(a), 156, 157. The creation of the ISA generated some controversy and led the United States to decline to sign the LOS Convention in 1983. The controversy was later resolved in a subsequent agreement. See Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (1994).

<sup>37</sup> LOS Convention, art. 140(2).

<sup>38</sup> *Id.*, art. 144(1).

Figure 1: Overview of marine jurisdiction



Source: UN Department of Oceans and Law of the Sea

### 3 International legal regime for installation and maintenance of submarine cables

International law recognizes unique freedoms for the installation and maintenance of submarine cables. Various international treaties dating back to 1884 guarantee unique freedoms to lay, maintain, and repair submarine cables – freedoms not granted for any other marine activities – and restrict the ability of coastal states to regulate them.<sup>39</sup> Principles articulated in these treaties have since been recognized as customary international law.

Specifically, these treaties guarantee:

- The freedom to install submarine cables on the high seas beyond the continental shelf and to repair existing cables without impediment or prejudice;<sup>40</sup>
- The freedom to install and maintain submarine cables on the continental shelf,<sup>41</sup> subject to reasonable measures for the exploration of the continental shelf and the exploitation of its natural resources;<sup>42</sup>
- The freedom to install and maintain submarine cables in the exclusive economic zone of all states;<sup>43</sup>
- The ability to install submarine cables in a state's territory or territorial sea subject to conditions and exercise of national jurisdiction;<sup>44</sup> and

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<sup>39</sup> See Convention for the Protection of Submarine Telegraph Cables, Mar. 14, 1884, T.S. 380 ("1884 Convention"); Geneva Convention on the High Seas, April 29, 1958, 450 U.N.T.S. 82 ("High Seas Convention"); Geneva Convention on the Continental Shelf, Apr. 29, 1958, 499 U.N.T.S. 311 ("Continental Shelf Convention"); LOS Convention.

<sup>40</sup> High Seas Convention, arts. 2 ("Freedom of the high seas is exercised under the conditions laid down by these Articles and by the other rules of international law. It comprises, *inter alia*, both for coastal and non-coastal States: . . . Freedom to lay submarine cables and pipelines."), 26(1) ("All States shall be entitled to lay submarine cables and pipelines on the bed of the high seas"), 26(3) ("When laying such cables or pipelines the State in question shall pay due regard to cables or pipelines already in position on the seabed. In particular, possibilities of repairing existing cables or pipelines shall not be prejudiced."); LOS Convention art. 112(1) ("All States are entitled to lay submarine cables and pipelines on the bed of the high seas beyond the continental shelf.").

<sup>41</sup> LOS Convention arts. 79(1) ("All States are entitled to lay submarine cables and pipelines on the continental shelf, in accordance with the provisions of this article"), 79(5) ("When laying submarine cables or pipelines, States shall have due regard to cables or pipelines already in position. In particular, possibilities of repairing existing cables or pipelines shall not be prejudiced."). See also LOS Convention, art. 78(2) ("The exercise of the rights of the coastal State over the continental shelf must not infringe or result in any unjustifiable interference with navigation and other rights and freedoms of other States as provided for in this Convention.").

<sup>42</sup> Continental Shelf Convention, art. 4 ("Subject to its right to take reasonable measures for the exploration of the continental shelf and the exploitation of its natural resources, the coastal State may not impede the laying or maintenance of submarine cables or pipe lines on the continental shelf."); LOS Convention, art. 79(2) ("Subject to its right to take reasonable measures for the exploration of the continental shelf, the exploitation of its natural resources and the prevention, reduction and control of pollution from pipelines, the coastal State may not impede the laying or maintenance of such cables or pipelines"); *id.*, art. 79(4) ("Nothing in this Part affects the . . . [coastal state's] jurisdiction over cables and pipelines constructed or used in connection with the exploration of its continental shelf or exploitation of its resources or the operations of artificial islands, installations and structures under its jurisdiction."). The course of a pipeline on the continental shelf is subject to coastal-state consent, while the course of a submarine cable is not. See *id.*, art. 79(3) ("The delineation of the course for the laying of such pipelines on the continental shelf is subject to the consent of the coastal State.").

<sup>43</sup> *Id.*, art. 58(1) ("In the exclusive economic zone, all States, whether coastal or land-locked, enjoy, subject to the relevant provisions of this Convention, the freedoms referred to in article 87 of navigation and overflight and of the laying of submarine cables and pipelines.").

<sup>44</sup> *Id.*, art. 79(4) ("Nothing in this Part affects the right of the coastal State to establish conditions for cables or pipelines entering its territory or territorial sea.").

- The freedom to maintain existing submarine cables passing through the waters of an archipelagic state without making landfall.<sup>45</sup>

These treaty obligations are now treated as customary international law,<sup>46</sup> even by states that have not ratified them.<sup>47</sup>

For purposes of the EEZ and continental shelf, submarine cables are distinguished from (1) artificial islands, (2) structures and installations used for exploration or exploitation of living or nonliving natural resources or for “other economic purposes,” and (3) installations and structures which may interfere with the exercise of the rights of the coastal state in the EEZ or on the continental shelf.<sup>48</sup> Although these treaties permit coastal states to take reasonable measures respecting natural resource exploitation on the Continental Shelf, they bar states from taking such measures with respect to submarine cables, the construction and repair of which are not undertaken for natural resource exploration or exploitation.<sup>49</sup> These treaty provisions are reflected in the official position of the United Nations’ Office of Legal Affairs of the Division for Ocean Affairs and the Law of the Sea, which states that:

Beyond the outer limits of the 12 nm territorial sea, the coastal State may not (and should not) impede the laying or maintenance of cables, even though the delineation of the course for the laying of such pipelines [but not submarine cables] on the continental shelf is subject to its consent. The coastal State has jurisdiction only over cables constructed or used in connection with the exploration of its continental shelf or exploitation of its resources or the operations of artificial islands, installations and structures under its jurisdiction.<sup>50</sup>

Thus, a coastal nation must forbear from imposing any restrictions on the installation or maintenance of submarine cables unless those submarine cables themselves are used for natural resource exploration or exploitation.

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<sup>45</sup> *Id.*, art. 51(2).

<sup>46</sup> Delimitation of the Maritime Boundary of the Gulf of Maine (Canada/United States), 1984 I.C.J. Rep. 246, 294 ¶ 94 (“The Chamber notes in the first place that the Convention adopted at the end of the [Third United Nations Conference on the Law of the Sea] has not yet come into force and that a number of States do not appear inclined to ratify it. This, however, in no way detracts from the consensus reached on large portions of the instrument and, above all, cannot invalidate the observation that certain provisions of the Convention, concerning the continental shelf and the exclusive economic zone, . . . were adopted without any objections. The United States, in particular, in 1983 . . . proclaimed an economic zone on the basis of Part V of the 1982 Convention. This proclamation was accompanied by a statement by the President to the effect that in respect the Convention generally confirmed existing rules of international law. Canada, which has not at present made a similar proclamation, has for its part also recognized the legal significance of the nature and purpose of the 200-mile regime. This concordance of views is worthy of note . . . In the Chamber’s opinion, these provisions, even if in some respects they bear the mark of compromise surrounding their adoption, may nevertheless be regarded as consonant at present with general international law on the question.”).

<sup>47</sup> The United States, for example, recognized these freedoms starting in 1983, even though the United States has never ratified the LOS Convention (it signed only in 1994) and even though the Convention did not enter into force for those states that had ratified it until 1994. Presidential proclamations by two different U.S. presidents expressly stated that the establishments of an EEZ and a contiguous zone, respectively, did not infringe on the high-seas freedoms to lay and repair submarine cables. See United States of America, Presidential Proclamation No. 5030 (10 Mar. 1983), 48 Fed. Reg. 10,605 (14 Mar. 1983) (establishing the U.S. EEZ); Presidential Proclamation No. 7219 (2 Aug. 1999), 64 Fed. Reg. 48,701 (2 Aug. 1999) (establishing the U.S. contiguous zone).

<sup>48</sup> LOS Convention, arts. 56, 60(1), 80.

<sup>49</sup> *Id.*, art. 79(2); Continental Shelf Convention, art. 4.

<sup>50</sup> United Nations Department of Oceans and Law of the Sea, Office of Legal Affairs, *Maritime Space: Maritime Zones and Maritime Delimitations – Frequently Asked Questions* (responding to Question #7, “What regime applies to the cables and pipelines?”), [www.un.org/Depts/los/LEGISLATIONANDTREATIES/frequently\\_asked\\_questions.htm](http://www.un.org/Depts/los/LEGISLATIONANDTREATIES/frequently_asked_questions.htm) (last visited Mar. 28, 2012).

Coastal states also have obligations to prevent willful or negligent damage to cables,<sup>51</sup> and all states “shall have due regard [for] cables [and] pipelines already in position.”<sup>52</sup> Submarine cables are thus afforded a great degree of protection from regulation or interference by coastal states, reflecting the vital role that submarine cables play in facilitating communications, commerce, and government. Nevertheless, it is the submarine cable operators themselves who have developed industry standards and private contractual arrangements for managing marine spatial conflicts, including minimum separation distances between cables and cable-crossing and cable-pipeline crossing agreements.<sup>53</sup>

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<sup>51</sup> LOS Convention, art. 113 (“Every State shall adopt the laws and regulations necessary to provide that the breaking or injury by a ship flying its flag or by a person subject to its jurisdiction of a submarine cable beneath the high seas done willfully or through culpable negligence, in such a manner as to be liable to interrupt or obstruct telegraphic or telephonic communications, and similarly the breaking or injury of a submarine pipeline or high-voltage power cable, shall be a punishable offence. This provision shall apply also to conduct calculated or likely to result in such breaking or injury. However, it shall not apply to any break or injury caused by persons who acted merely with the legitimate object of saving their lives or their ships, after having taken all necessary precautions to avoid such break or injury.”).

<sup>52</sup> *Id.*, art. 79(5).

<sup>53</sup> Industry standards have been developed over many decades to facilitate cable installation, retrieval and repair operations above and below the ocean surface. These standards minimize the risk of damage to neighbouring cables during installation and maintenance operations and ensure access to a damaged cable with both a cable ship and other equipment to be used on the sea floor. *See, e.g.*, International Cable Protection Committee Recommendation No. 2 at 5 (providing that when cables must cross, they should do so at 90-degree angles in order to minimize the length of cable that is immediately adjacent to another cable), 10 (providing that two parallel cables are to be separated by a distance equal to the lesser of three (3) times the depth of water or nine (9) kilometers, and that if both operators of parallel cables agree, those two cables may be separated by a distance equal to the lesser of two (2) times the depth of water, or (6) six kilometers), available from the International Cable Protection Committee at [www.iscpc.org](http://www.iscpc.org).

## 4 International legal regime for marine data collection

International law recognizes the authority of coastal states to regulate certain forms of marine data collection,<sup>54</sup> though the nature of that authority depends on the purpose, content, method, and location of the data collection. The LOS Convention recognizes three separate categories of marine data collection: MSR, surveys, and exploration and exploitation of living and non-living resources. To encourage the advancement of science and the peaceful dissemination of information, some states have distinguished a fourth category of marine data collection – operational oceanography – though the concept and its consequences remain hotly disputed.

### 4.1 Marine scientific research

#### 4.1.1 «Marine scientific research» undefined

The 1982 LOS Convention provisions dealing with MSR (in Part XIII) are rooted in the 1958 Continental Shelf Convention.<sup>55</sup> That earlier convention required consent of coastal state for “research,” presumed coastal consent would be granted so long as research was “purely scientific” and conducted by a qualified institution, and granted the coastal state the right to participate in the research.<sup>56</sup>

The LOS Convention does not, however, define MSR. At most, the Convention makes passing references to scientists “studying the essence of phenomena and processes occurring in the marine environment and the interrelations between them”<sup>57</sup> and projects “carried out in accordance with this Convention exclusively for peaceful purposes and in order to increase scientific knowledge of the marine environment for the benefit of all mankind.”<sup>58</sup> Instead, the Convention tasks the signatories with defining MSR in practice. “States shall seek to promote through competent international organizations the establishment of general criteria and guidelines to assist States in *ascertaining the nature and implications of marine scientific research.*”<sup>59</sup>

The absence of such a definition reflects an unresolved drafting dispute. One camp believed that pure/fundamental research should always be permitted, whereas applied/resource-oriented research should require consent of the coastal state in the EEZ or continental shelf of which the research was to be conducted. The opposing camp believed that it was impossible to differentiate pure research from applied research.<sup>60</sup> The result was a muddled set of consent requirements for an ill-defined set of activities.<sup>61</sup> Coastal states have consequently asserted that they have discretion to define the scope of MSR. This has created friction with other provisions in the LOS Convention.

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<sup>54</sup> The term “marine data collection” does not appear in any of the relevant treaties or court decisions, though a number of commentators – J. Ashley Roach chief among them – have used the term to describe and distinguish a particular set of marine activities. J. Ashley Roach, *Marine Data Collection: Methods and the Law* at 171-73, in *FREEDOM OF THE SEAS, PASSAGE RIGHTS, AND THE 1982 LAW OF THE SEA CONVENTION* (Myron H. Nordquist, Tommy T.B. Koh, and John Norton Moore eds., Martinus Nijhoff Publishers, 2009) (“Roach”).

<sup>55</sup> The Law of the Sea: Marine Scientific Research - A revised guide to the implementation of the relevant provisions of the United Nations Convention on the Law of the Sea, Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs, United Nations (2010), at 1-2 (“UN MSR Guide”).

<sup>56</sup> Continental Shelf Convention, art. 5(8).

<sup>57</sup> LOS Convention, art. 243.

<sup>58</sup> *Id.*, art. 246(3).

<sup>59</sup> *Id.*, art. 251 (emphasis added).

<sup>60</sup> See UN MSR Guide at 4-6.

<sup>61</sup> See UNITED NATIONS CONVENTION ON THE LAW OF THE SEA 1982 - A COMMENTARY, vol. IV (Myron H. Nordquist et al. eds., Martinus Nijhoff Publishers, 1991) at 433-35 (“Nordquist”).

#### 4.1.2 Qualified right to conduct marine scientific research

The LOS Convention grants to all states and competent international organizations a qualified right to conduct MSR. “All States, irrespective of their geographical location, and competent international organizations have the right to conduct marine scientific research subject to the rights and duties of other States as provided for in this Convention.”<sup>62</sup> “[M]arine scientific research shall be conducted in compliance with all relevant regulations adopted in conformity with this Convention including those for the protection and preservation of the marine environment.”<sup>63</sup>

On the continental shelf or in the EEZ of a coastal state, however, consent is required for the conduct of MSR. “Coastal States, in the exercise of their jurisdiction, have the right to regulate, authorize and conduct marine scientific research in their exclusive economic zone and on their continental shelf in accordance with the relevant provisions of this Convention.”<sup>64</sup> Within the territorial sea of a coastal state, MSR may be conducted only with the express consent of, and subject to compliance with any conditions established by, the coastal state.<sup>65</sup> In straits used for international navigation and in archipelagic sea lanes, foreign ships used for MSR may not carry out any MSR activities during their transit passage or archipelagic sea lanes passage without the prior authorization of the coastal states bordering the straits.<sup>66</sup> All states and competent international organizations have the right to conduct MSR in the water column beyond the limits of any coastal state’s EEZ.<sup>67</sup> Moreover, all states and competent international organizations have the right to conduct MSR in “the Area,” defined as the seabed and ocean floor and subsoil thereof beyond the limits of national jurisdiction.<sup>68</sup>

Although the Convention affords coastal states these jurisdictional rights, coastal states may decline to exercise them. The United States, for example, stated in 1983 that it would not exercise jurisdiction over MSR conducted in the U.S. EEZ.<sup>69</sup> Indeed, the United States has since identified expansive categories of activities

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<sup>62</sup> LOS Convention, art. 238.

<sup>63</sup> *Id.*, art. 240(d).

<sup>64</sup> *Id.*, art. 246(1).

<sup>65</sup> *Id.*, art. 245.

<sup>66</sup> *Id.*, arts. 40 (“During transit 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 States bordering straits.”), 54 (applying the same to archipelagic sea lanes).

<sup>67</sup> *Id.*, arts. 78(1), 87(1)(f), and 257. Of course, a flagging state may regulate the activities of its vessel used in marine scientific research – or any other marine data collection activities – on the high seas. *Id.*, arts. 91 (providing that a ship has the nationality of the state whose flag it flies), 94(2)(b) (a state must “assume jurisdiction under its internal law over each ship flying its flag and its master, officers and crew in respect of administrative, technical and social matters concerning the ship.”).

<sup>68</sup> *Id.*, art. 256. With respect to exploration and exploitation of natural resources, the Area is within the jurisdiction of the International Seabed Authority. *See id.* Part XI.

<sup>69</sup> United States of America, President Ronald Reagan, Statement on United States Oceans Policy (10 Mar. 1983) (“While international law provides for a right of jurisdiction over marine scientific research within [the EEZ], the proclamation does not assert this right. I have elected not to do so because of the United States interest in encouraging marine scientific research and avoiding unnecessary burdens. The United States will nevertheless recognize the right of other coastal states to exercise jurisdiction over marine scientific research within 200 nautical miles of their coasts, if that jurisdiction is exercised reasonably in a matter consistent with international law.”). This position has since been refined to require consent for certain limited categories of activities, but not “operational oceanography,” as discussed in part IV.D below. The consent of the United States is required for marine scientific research only where: (1) any portion of the marine scientific research is conducted within the U.S. territorial sea; (2) any portion of the marine scientific research within the U.S. EEZ is conducted within a national marine sanctuary or other marine protected area; (3) any portion of the marine scientific research within the U.S. EEZ involves the study of marine mammals or endangered species; (4) any portion of the marine scientific research within the U.S. EEZ requires taking commercial quantities of marine resources; (5) any portion of the marine scientific research within the U.S. EEZ involves contact with the U.S. continental shelf; or (6) any portion of the marine scientific research within the U.S. EEZ involves ocean dumping research. *Marine Scientific Research Authorizations*, United States Department of State, [www.state.gov/e/oes/ocns/opa/rvc/index.htm](http://www.state.gov/e/oes/ocns/opa/rvc/index.htm) (last visited 28 Mar. 2012) (“US MSR Authorizations”).



which it believes do not constitute MSR.<sup>70</sup> Few states appear to have followed the approach of the United States. Nevertheless, a number of states have adopted commitments under the World Trade Organization General Agreement on Trade in Services (“GATS”) that could preclude application of MSR restrictions to submarine cables.<sup>71</sup>

#### 4.1.3 Consent requirements

The LOS Convention treats MSR within a coastal state’s EEZ or continental shelf as activity subject to consent that should be granted in “normal circumstances” so long as the MSR is conducted (1) exclusively for peaceful purposes and (2) in order to increase scientific knowledge.<sup>72</sup> Even in normal circumstances, the state or international organization seeking to conduct MSR must provide the coastal state with extensive information at least six months in advance of the intended research.<sup>73</sup> A coastal state may withhold consent in exceptional circumstances.

##### 4.1.3.1 Exceptional circumstances

Within the EEZ, these exceptional circumstances include:

- Direct significance for the exploration and exploitation of natural resources, whether living or non-living;
- “Drilling” into the continental shelf, the use of explosives, or the introduction of harmful substances into the marine environment;
- Construction, operation or use of artificial islands, installations and structures referenced in articles 60 and 80 of the LOS Convention;<sup>74</sup> and
- Misrepresentation by the researching state to the coastal state.<sup>75</sup>

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<sup>70</sup> These activities include: (1) the exploration and exploitation of natural resources; (2) hydrographic surveys for enhancing the safety of navigation; (3) military activities and surveys; (4) environmental monitoring and assessment pursuant to Section 4 of Part XII of the LOS Convention; (5) activities directed at submerged wrecks or objects of an archeological and historical nature; and (6) the collection of marine meteorological data and other routine ocean observations, including through the voluntary ocean observation programs of the Joint IOC-WMO Technical Commission on Oceanography and Marine Meteorology and the Argo program. See US MSR Authorizations.

<sup>71</sup> Many WTO members have scheduled specific commitments permitting service suppliers from other WTO member-countries to engage in: (1) “other electrical construction work” including “telecommunications equipment installation work”; (2) “repair services of radio, television and communication equipment and apparatus, on a fee or contract basis”; and (3) “communications equipment maintenance services.” See World Trade Organization, Services Database, <http://tsdb.wto.org>.

<sup>72</sup> LOS Convention, art. 246(3). The LOS Convention provides for “implied consent,” but states and researchers have not relied on these provisions in practice, as coastal states have not effectively implemented article 246(3) of the LOS Convention as the “implied consent” provisions presuppose. See *id.*, art. 252; Roach at 178 n. 16.

<sup>73</sup> LOS Convention, art. 248.

<sup>74</sup> Article 60 provides:

In the exclusive economic zone, the coastal State shall have the exclusive right to construct and to authorize and regulate the construction, operation and use of:

- (a) artificial islands;
- (b) installations and structures for the purposes provided for in article 56 and other economic purposes;
- (c) installations and structures which may interfere with the exercise of the rights of the coastal State in the zone.

Article 80 extends these provisions to the continental shelf.

<sup>75</sup> *Id.*, art. 246(5).

On the continental shelf beyond the EEZ, these exceptional circumstances include designated areas in which exploitation or detailed exploratory operations are occurring or will occur within a reasonable period of time.<sup>76</sup>

#### 4.1.3.2 *Timing*

The process for obtaining consent can be time-consuming and requires significant advance planning. A state intending to undertake MSR in the EEZ or continental shelf of a coastal state must provide a full description of the project at least 6 months in advance, including vessel and equipment details, vessel schedules, and participation opportunities for coastal state.<sup>77</sup> Timing also remains uncertain. If the coastal state objects within four months of receiving the initial notification, the consent process can take even longer.<sup>78</sup>

### 4.1.4 **Conditions in the EEZ or on the continental shelf**

#### 4.1.4.1 *Standard conditions*

States or international organizations undertaking MSR in the EEZ or on the continental shelf of a coastal state 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 onboard research vessels and other craft or scientific research installations, when practicable, without payment of any remuneration to the scientists of the coastal State and without obligation to contribute towards the costs of the project;
- (b) provide the coastal State, at its request, with preliminary reports, as soon as practicable, and with the final results and conclusions after the completion of the research;
- (c) undertake to provide access for the coastal State, at its request, to all data and samples derived from the marine scientific research project and likewise to furnish it with data which may be copied and samples which may be divided without detriment to their scientific value;
- (d) if requested, provide the coastal State with an assessment of such data, samples and research results or provide assistance in their assessment or interpretation;
- (e) ensure, subject to paragraph 2, that the research results are made internationally available through appropriate national or international channels, as soon as practicable;
- (f) inform the coastal State immediately of any major change in the research programme;
- (g) unless otherwise agreed, remove the scientific research installations or equipment once the research is completed.<sup>79</sup>

#### 4.1.4.2 *Other conditions; Limitations on data dissemination*

In cases involving exceptional circumstances, a coastal state may impose:

conditions established by the laws and regulations of the coastal State for the exercise of its discretion to grant or withhold consent pursuant to article 246, paragraph 5, including requiring prior agreement

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<sup>76</sup> *Id.*, art. 246(6).

<sup>77</sup> *Id.*, art. 248. See also UN MSR Guide, Annex I, Draft standard form A – Application for consent to conduct marine scientific research.

<sup>78</sup> LOS Convention, art. 252.

<sup>79</sup> *Id.*, art. 249(1).

for making internationally available the research results of a project of direct significance for the exploration and exploitation of natural resources.<sup>80</sup>

Moreover, a coastal state may object to data dissemination on the grounds of national security by invoking a general exception in the LOS Convention. “[N]othing in this Convention shall be deemed to require a State Party, in the fulfillment of its obligations under this Convention, to supply information the disclosure of which is contrary to the essential interests of its security.”<sup>81</sup>

#### 4.1.5 Intergovernmental process

The consent process is typically an intergovernmental one, meaning that to obtain authorization to conduct MSR, individuals and organizations – whether commercial or non-profit – must approach a coastal state’s government through their own governments, unless states agree otherwise. “Communications concerning the marine scientific research projects shall be made through appropriate official channels, unless otherwise agreed.”<sup>82</sup> The UN MSR Guide includes draft standard forms for states and competent international organizations to use in seeking consent, granting consent, and providing a preliminary cruise report.<sup>83</sup> Many states have adopted or adapted these template forms for their own use.

Use of the diplomatic channel renders the process more time-consuming and cumbersome, as a party seeking to conduct MSR must first satisfy its own national-level requirements before its governments may seek the consent of the coastal state. It also poses special challenges where the coastal state and the state seeking MSR authorization do not maintain diplomatic relations with each other.

#### 4.1.6 Equipment and installations

The same requirements apply to vessels, equipment, and installations used in MSR. “The deployment and use of any type of scientific research installations or equipment in any area of the marine environment shall be subject to the same conditions as are prescribed in this Convention for the conduct of marine scientific research in any such area.”<sup>84</sup> The Convention requires the use of identification markings and warning signals for such equipment and installations.<sup>85</sup> The Convention permits the establishment of safety zones “of a reasonable breadth not exceeding a distance of 500 metres” around scientific research installations.<sup>86</sup> The Convention also requires that the deployment and use of scientific research installations “not constitute an obstacle to established international shipping routes.”<sup>87</sup>

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<sup>80</sup> *Id.*, art. 249(2).

<sup>81</sup> *Id.*, art. 302.

<sup>82</sup> *Id.*, art. 250.

<sup>83</sup> UN MSR Guide, Annex I, Draft standard form A – Application for consent to conduct marine scientific research; Draft standard form B – Consent to conduct marine scientific research; Draft standard form C – Preliminary cruise report.

<sup>84</sup> LOS Convention, art. 258.

<sup>85</sup> *Id.*, art. 262 (“Installations or equipment referred to in this section shall bear identification markings indicating the State of registry or the international organization to which they belong and shall have adequate internationally agreed warning signals to ensure safety at sea and the safety of air navigation, taking into account rules and standards established by competent international organizations.”).

<sup>86</sup> *Id.*, art. 260.

<sup>87</sup> *Id.*, art. 261.

#### 4.1.7 Marine scientific research in the Area

Marine scientific research in the Area may be carried out by “State Parties” or the ISA itself<sup>88</sup> and must be carried out “exclusively for peaceful purposes and for the benefit of mankind as a whole, in accordance with Part XIII.”<sup>89</sup> The ISA is tasked with promoting the conduct of MSR in the Area and coordinating and disseminating the results of such research and analysis. State parties must promote international cooperation in MSR in the Area by (among other means): participating in international programs; ensuring that the ISA and international organizations develop programs for the benefit of developing and less technologically-developed states; training their personnel and ISA personnel in the techniques and applications of research; and effectively disseminating the results of research and analysis when available, through the ISA or other international channels when appropriate.<sup>90</sup>

## 4.2 Surveys

In the LOS Convention, “surveys” and “hydrographic surveys” are treated separately from “research” and “marine scientific research,” suggesting that by definition surveys do not constitute MSR.<sup>91</sup> Prior consent is required from the coastal state for the conduct of a hydrographic survey in the territorial sea, from states bordering an international strait for the conduct of a survey while transiting such a strait, and from an archipelagic state for the conduct of a survey while transiting archipelagic sea lanes.<sup>92</sup> The LOS Convention does not restrict hydrographic surveys beyond the territorial sea, so the conduct of hydrographic surveys in the EEZ, on the continental shelf, or in the Area is a high-seas freedom.<sup>93</sup> Nevertheless, a number of states and commentators assert that coastal states have jurisdiction over hydrographic surveys in the EEZ or on the continental shelf.<sup>94</sup>

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<sup>88</sup> *Id.*, art. 143(2), (3). A “State Party” is a state that has “consented to be bound by this Convention and for which this Convention is in force.” *Id.*, art. 1(2)(1).

<sup>89</sup> *Id.*, art. 143(1).

<sup>90</sup> *Id.*, art. 143(3).

<sup>91</sup> *Id.*, arts. 19(2)(j) (referencing “the carrying out of research or survey activities” in relation to the right of innocent passage), 21(1)(g) (referencing “marine scientific research and hydrographic surveys” in relation to the state regulation of innocent passage). See also Alfred H.A. Soons, *Marine Scientific Research and the Law of the Sea* (Kluwer Law and Taxation Publishers, 1982) at 125 (“From articles 19, 21 and 40, which use the term ‘hydrographic surveying’ separately from ‘research’ it follows that the term ‘marine scientific research,’ for the purposes of the Draft Convention, does not cover hydrographic surveying activities.”), at 157 (noting that hydrographic surveying, “when it is conducted for the purpose of enhancing the safety of navigation . . . must be regarded as an internationally lawful use of the sea associated with the operation of ships . . . in accordance with Article 58, and can therefore be conducted freely in the exclusive economic zone”); Roach at 180 (“Hydrographic surveys are not MSR.”).

<sup>92</sup> LOS Convention, arts. 19(2)(j) and 21(1)(g) (territorial sea), 40 (international straits), and 54 (archipelagic sea lanes).

<sup>93</sup> *Id.*, arts. 58(1), 87. But see Ocean Policy Research Foundation, *Guidelines for Navigation and Overflight in the Exclusive Economic Zone*, EEZ Group 21 (2005) (“OPRF Guidelines”), art. IX(a) (“Hydrographic surveying should only be conducted in the EEZ of another State with the consent of the coastal State. This does not apply to the collection of navigational data by a ship required for safe navigation during the ship’s passage through an EEZ.”). The OPRF Guidelines classify hydrographic surveys as marine scientific research. See *id.*, art. IX(b).

<sup>94</sup> See, e.g., People’s Republic of China, Surveying and Mapping Law, art. 7 (Dec. 1, 2002) <http://en.sbsm.gov.cn/article/LawsandRules/Laws/200710/20071000003241.shtml> (“Foreign organizations or individuals that wish to conduct surveying and mapping in the territorial air, land or waters, as well as other sea areas under the jurisdiction of the People’s Republic of China shall be subject to approval by the administrative department for surveying and mapping under the State Council and the competent department for surveying and mapping of the army, and they shall observe the provisions of relevant laws and administrative rules and regulations of the People’s Republic of China.”); Sam Bateman, *A Response to Ped-rozo: The Wider Utility of Hydrographic Surveys*, 10 CHINESE JOURNAL INT’L LAW 177 (2011) (characterizing the view that hydrographic surveys are not marine scientific research as “anachronistic” given the economic utility of such surveys).

### 4.2.1 Hydrographic surveys

Although “hydrographic survey” is not defined in the LOS Convention, the term is generally understood to mean the collection of marine data for creation of navigational charts and promoting the safety of navigation.<sup>95</sup> It may involve collection of the same information as with MSR, though it is distinguished by the purposes for which that information is gathered.

### 4.2.2 Submarine cable related surveys

Submarine cable suppliers and survey companies conduct cable route surveys and burial-assessment surveys to identify seabed hazards – such as rocky seabed, reefs, and steep slopes – and optimize submarine cable routing and cable-type selection. Ultimately, these surveys are used to reduce the cost of installation and future maintenance of the submarine cable. These surveys involve the collection of bathymetric and geomorphologic data using single- and multi-beam bathymetry systems, side-scan sonar, and sub-bottom profiler equipment, as well as the collection of seabed samples and cone penetrometer tests to determine the composition and geotechnical properties of the seabed.<sup>96</sup> As cable route surveys and burial-assessment surveys are integral components of the processes for installation and maintenance of submarine cables, commentators and industry representatives have long argued that the conduct of such surveys in the EEZ and on the continental shelf is governed by the submarine-cable freedoms noted in part II above.<sup>97</sup> Nevertheless, as with hydrographic surveys, a number of governments have asserted jurisdiction to regulate such surveys in the EEZ and on the continental shelf.

### 4.2.3 Military surveys

Some commentators also distinguish military surveys from other marine data collection activities, including MSR.<sup>98</sup> The LOS Convention makes no explicit mention of military surveys. The subject of military surveys in the EEZ and on the continental shelf – and their relationship to hydrographic surveys – remains a contentious subject.<sup>99</sup>

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<sup>95</sup> International Hydrographic Bureau, *A Manual on Technical Aspects of the United Nations Law of the Sea Convention – 1982*, Special Pub No. 51 (4th ed. 2006) at Appendix 1-5 (defining “hydrographic survey” as 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 landmass, and the characteristics and dynamics of the sea.”); International Hydrographic Organization, Definition of Hydrography, [www.iho.int/srv1/index.php?option=com\\_content&view=article&id=299&Itemid=289](http://www.iho.int/srv1/index.php?option=com_content&view=article&id=299&Itemid=289) (14 Sept. 2011) (defining hydrography as “the branch of applied sciences which deals with the measurement and description of the physical features of oceans, seas, coastal areas, lakes and rivers, as well as with the prediction of their change over time, for the primary purpose of safety of navigation and in support of all other marine activities, including economic development, security and defence, scientific research, and environmental protection.”); Sam Bateman, *Hydrographic Surveying in the Exclusive Economic Zones*, 5 INTERNATIONAL HYDROGRAPHIC REVIEW 76, 81 (2004) (“The primary use of the hydrographic data collected during surveys is to compile nautical charts and other documents to facilitate and ensure the safety of navigation and for use by others concerned with the marine environment such as ocean engineers, oceanographers, marine biologists and environmental scientists.”).

<sup>96</sup> See, e.g., Tyco Electronics Subsea Communications, LLC, *Route Survey*, [www.subcom.com/process/design/route-survey.aspx](http://www.subcom.com/process/design/route-survey.aspx) (last visited Mar. 28, 2012); Fugro NV, *Marine Surveys*, [www.fugro.com/datasheets/services/Marine%20Surveys.pdf](http://www.fugro.com/datasheets/services/Marine%20Surveys.pdf) (last visited 28 Mar. 2012); EGS Group, *EGS Submarine Cable Services*, [www.egssurvey.com/pdf/services/sector\\_egs%20cable%20services.pdf](http://www.egssurvey.com/pdf/services/sector_egs%20cable%20services.pdf) (last visited 28 Mar. 2012).

<sup>97</sup> See, e.g., Kent Bressie, *Improper Regulation of Undersea Cable Activities as “Marine Scientific Research,”* International Cable Protection Committee Plenary Meeting (Apr. 22, 2009), [www.wiltshiregrannis.com/siteFiles/News/22873CC28312196005574E4B428F4C64.pdf](http://www.wiltshiregrannis.com/siteFiles/News/22873CC28312196005574E4B428F4C64.pdf); Douglas Burnett, *Cable Route Surveys Are Not Marine Scientific Research*, SUBTEL FORUM No. 43 at 30-34 (Mar. 2009).

<sup>98</sup> See Roach at 175 (describing military surveys as the “collection of marine data for military – not scientific – purposes. The data collected may include oceanographic, hydrographic, marine geological/geophysical, chemical, acoustic, biological and related data. The data may be collected in classified or unclassified form. The data is [sic] not normally available to the public or the scientific community unless it is unclassified and was collected on the high seas.”).

<sup>99</sup> See OPRF Guidelines parts IV and V; Nathalie Klein, *MARITIME SECURITY AND THE LAW OF THE SEA* (Oxford, 2011) at 214-24.

### 4.3 Exploration and exploitation of marine resources

The LOS Convention grants coastal states some jurisdiction over marine data collected during the exploration and exploitation of living and non-living resources, though the scope of the jurisdiction depends on the maritime zone.<sup>100</sup>

- Within the EEZ, the coastal state has:
  - sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil, and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds.<sup>101</sup>
- On the continental shelf, the coastal state has “sovereign rights for the purpose of exploring it and exploiting its natural resources,”<sup>102</sup> which “consist of the mineral and other non-living resources of the seabed and subsoil together with living organisms belonging to sedentary species.”<sup>103</sup>
- In the Area, the ISA regulates the exploration and exploitation of solid, liquid, or gaseous mineral resources (including polymetallic nodules).<sup>104</sup>
- On the high seas, the conservation and management of the living resources of the high seas (including fish and marine mammals) is governed by Part VII, Section 2, of the LOS Convention.

### 4.4 Operational oceanography

Certain states long have sought to distinguish routine ocean monitoring and marine meteorology (which they term “operational oceanography”) from MSR. Operational oceanography is the:

[R]outine collection of ocean observations, such as temperature, pressure, current, salinity and wind, in all maritime zones. It may be conducted in the oceans, at the air-sea interface, and in the atmosphere. This data is [sic] used for the monitoring and forecasting of weather (meteorology), climate, and ocean state (e.g., surface currents and waves). The data is [sic] transmitted from sensor to shore in near real-time and is made available to the public in near real-time.<sup>105</sup>

During the drafting of the LOS Convention, a number of parties expressed concerns that the MSR provisions of the proposed convention would restrict marine meteorology.<sup>106</sup> Commentators and some governments

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<sup>100</sup> Items and areas pertaining to underwater cultural heritage, such as shipwrecks and archeological sites, are neither living nor nonliving resources. They are addressed separately in the UNESCO Convention on the Protection of the Underwater Cultural Heritage (2 Nov. 2001), *reprinted in* 41 I.L.M. 37 (2002).

<sup>101</sup> LOS Convention, art. 56(1)(a).

<sup>102</sup> *Id.*, art. 77(1).

<sup>103</sup> *Id.*, art. 77(4). “Organisms belonging to sedentary species” are “organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil.” *Id.*

<sup>104</sup> *See id.*, Part XI; part I above.

<sup>105</sup> Roach at 175-76.

<sup>106</sup> *See, e.g.*, René Jean Dupuy and Daniel Vignes, *A HANDBOOK ON THE NEW LAW OF THE SEA*, (Kluwer Academic Publishers, 1993) at 221 (“Dupuy-Vignes”) (noting “strong negative reactions to the provisions regarding marine scientific research among oceanographers”); Report of the Chairman of the Third Committee, *Official Records of the 134th Plenary of the Resumed Ninth Session of the Third United Nations Conference on the Law of the Sea*, vol. 14, U.N. Doc. A/CONF.62/L.61 at 134 (Aug. 25, 1980) (wherein the Chairman of the Third Committee responded to concerns of the World Meteorological Organization that the proposed marine scientific research provisions have a restricting effect on the operational and research activities of the Organization by stating his view that “the pertinent provisions of [the articles dealing with] marine scientific research would not create any difficulties or obstacles hindering adequate meteorological coverage from the ocean areas, including areas within the exclusive economic zone since such activities have already been recognized as routine activities within the terms of reference of the World Meteorological Organizations and are of common interest to all countries with an undoubted universal significance.”).

have analogized marine meteorology to other routine ocean-observation activities, in an effort to liberate such activities from the strictures imposed by the LOS Convention on MSR.<sup>107</sup> Although various assurances were given during the Third United Nations Conference on the Law of the Sea, the text of the LOS Convention itself makes no mention of “marine meteorology,” “routine ocean observations,” or “operational oceanography,” and the relationship between operational oceanography and MSR remains in dispute.<sup>108</sup>

Disputes over the deployment of the Argo profiling floats illustrate the conflict over the proper treatment of instruments and devices – particularly those with new technologies – used to make routine ocean observations. The Argo float program is a global array of more than 3,000 free-drifting floats used to measure ocean temperature, salinity, and velocity to a depth of 2,000 meters, with recorded data transmitted periodically via the Argos and Iridium satellite systems.<sup>109</sup> Twenty-three countries have contributed to the program, which is overseen by the International Argo Steering Team.<sup>110</sup> As the floats have the potential to drift into EEZ and continental-shelf zones, many states objected that advanced notice or consent was required with respect to floats having the potential to drift into their EEZs or continental shelf areas.<sup>111</sup>

In 2008, following significant controversy, the Executive Council of the Intergovernmental Oceanographic Commission (“IOC”) of UNESCO adopted guidelines for the legal regulation of Argo profiling float deployments on the high seas.<sup>112</sup> An IOC member state “must be informed in advance, through appropriate channels, of the deployment in the high seas of any float within the framework of the Argo Programme . . . that may enter its EEZ.”<sup>113</sup> An IOC member state may declare at any time that it wishes to be notified of such a deployment.<sup>114</sup> The Argo Guidelines establish general and specific communications mechanisms between deploying states and coastal states, and allow the coastal state to restrict the release of marine data for a limited period of time if such data is “of direct significance for the exploration and exploitation of natural resources, whether living or non-living.”<sup>115</sup>

There remains little agreement about the Argo Guidelines, which nearly led to the disbanding of the IOC’s Body of Experts on the Law of the Sea.<sup>116</sup> The United States and many European nations, particularly the United Kingdom, view Guideline 1 as an infringement of the freedom of navigation and overflight on the high seas.<sup>117</sup> At the other extreme, a number of states, led by Peru and Argentina, and with support from Japan, continue to insist that regardless of the Argo Guidelines, the operation of the Argo network constitutes MSR subject to the requirements of Part XIII of UNCLOS.<sup>118</sup> Commentators also continue to debate whether or not the floats themselves are ships, installations, or equipment.<sup>119</sup>

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<sup>107</sup> See, e.g., Ryder at 32; Roach at 194-95.

<sup>108</sup> See, e.g., Katharina Bork, Johannes Karstensen, and Martin Visbeck, *The Legal Regulation of Floats and Gliders – In Quest of a New Regime?*, 39 OCEAN DEVELOPMENT & INT’L LAW 298, 306-07 (2008) (“Bork et al.”); OPRF Guidelines, art. IX(c) (“The Guidelines in Articles VIII and IX also apply to aircraft, autonomous underwater vehicles (AUVs), remotely operated vehicles (ROVs) and other remotely operated devices of a State conducting research or collecting data in an EEZ.”)

<sup>109</sup> Argo, *Current Status of Argo*, [www.argo.ucsd.edu/About\\_Argo.html](http://www.argo.ucsd.edu/About_Argo.html) (last visited 28 Mar. 2012).

<sup>110</sup> Argo, *Organization*, [www.argo.ucsd.edu/Organisation.html](http://www.argo.ucsd.edu/Organisation.html) (last visited 28 Mar. 2012).

<sup>111</sup> See Mateos and Gorina-Ysern, part IV.

<sup>112</sup> Guidelines for the Implementation of Resolution XX-6 of the IOC Assembly Regarding the Deployment of Profiling Floats in the High Seas Within the Framework of the Argo Program, IOC Res. EC-XLI.4, Annex II, Executive Council, 41<sup>st</sup> Sess. (29 July 2008), <http://unesdoc.unesco.org/images/0017/001798/179861e.pdf> (“Argo Guidelines”).

<sup>113</sup> *Id.*, Guideline 1.

<sup>114</sup> *Id.*

<sup>115</sup> *Id.*, Guideline 4.

<sup>116</sup> Mateos and Gorina-Ysern, Introduction.

<sup>117</sup> *Id.*, part IV.

<sup>118</sup> *Id.*

<sup>119</sup> See, e.g., Bork et al. at 308-10.

## 5 Preliminary assessment of legal-regulatory considerations

As described in chapters 2 through 4 above, the legal-regulatory regimes relevant to commercial submarine cables and marine data collection are complex, and dual-purpose telecom-marine data cables do not fit easily within certain of these regimes. The nascent debate about the appropriate legal-regulatory treatment of telecom-marine data cables – and indeed the desirability of such cables at all – has been polarizing, with opposing camps taking “all bad” or “all good” views. The “all-bad” view denies that there are opportunities for cable operators and scientists, based on an assumption that coastal states will regulate telecom-marine data cables as MSR and on a concern that deployments of such cables will serve to erode submarine cable rights and freedoms. The “all-good” view denies the legal-regulatory newness and complexities of telecom-marine data cables and fails to account for the underlying forty-year dispute over MSR.

What both of these views fail to account for is that there is as yet no global agreement about the legal-regulatory treatment of telecom-marine data cables, nor is there likely to be anytime soon, given the intractable disputes over MSR. Consequently, there is likely to be variation and experimentation among coastal states and among potential telecom-marine data cables, as is typical when technological and commercial developments outpace existing legal-regulatory regimes.

### 5.1 *The LOS convention and customary international law do not classify dual purpose telecom-marine data cables definitively as MSR*

Although some government representatives and commentators have asserted that dual-purpose telecom-marine data cables are MSR by definition,<sup>120</sup> the text of the LOS Convention itself does not support such a conclusion. As discussed in chapters 3 and 4 above, the LOS Convention does not define “submarine cable” or “marine scientific research,” and it does not even reference the concept of “operational oceanography.” To the contrary, coastal states have hotly disputed the scope and meaning of the term “marine scientific research” since the earliest negotiations over the LOS Convention, and the resulting LOS Convention provisions regarding MSR essentially sidestep this dispute, rather than resolve it. Consequently, there is little agreement on the ordinary meaning of the LOS Convention’s MSR provisions,<sup>121</sup> whether with reference to their objectives and purpose, the preparatory work of their drafting,<sup>122</sup> or any subsequent agreements or established treaty interpretations to resolve these disagreements (of which there are none).<sup>123</sup> The intense

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<sup>120</sup> See, e.g., Anastasia Strati, Ministry of Foreign Affairs, Greece, *The Law – Existing rules and new challenges*, ITU 2011 Green Standards Week Workshop on Submarine Cables for Ocean/Climate Monitoring and Disaster Warning: Science, Engineering, Business and Law (Rome, 9 Sept. 2011) (“Strati”) (stating that “attachment of sensors and other scientific equipment ...to existing submarine cables... should be considered as falling under the legal regime of marine scientific research”), [www.itu.int/dms\\_pub/itu-t/oth/06/5B/T065B0000050041PPTTE.ppt](http://www.itu.int/dms_pub/itu-t/oth/06/5B/T065B0000050041PPTTE.ppt); Douglas Burnett, *Understanding the Differences Under UNCLOS Between Submarine Cables and Marine Scientific Research*, ITU 2011 Green Standards Week Workshop on Submarine Cables for Ocean/Climate Monitoring and Disaster Warning: Science, Engineering, Business and Law (9 Sept. 2011) (assuming that sensors constitute MSR by definition and stating that “a dual use cable (telecom and MSR) is subject to the MSR regime (Part XIII)”), available at [www.itu.int/dms\\_pub/itu-t/oth/06/5B/T065B0000050043PPTTE.ppt](http://www.itu.int/dms_pub/itu-t/oth/06/5B/T065B0000050043PPTTE.ppt).

<sup>121</sup> See Vienna Convention on the Law of Treaties, 1155 U.N.T.S. 331 (entered into force 27 Jan. 1980) (“Vienna Convention on the Law of Treaties”), art 31(1) (providing that “a treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose.”).

<sup>122</sup> Vienna Convention on the Law of Treaties art. 32 (providing that “[r]ecourse may be had to supplementary means of interpretation, including the preparatory work of the treaty and the circumstances of its conclusion, in order to confirm the meaning resulting from the application of article 31, or to determine the meaning when the interpretation according to article 31:

- (a) Leaves the meaning ambiguous or obscure; or
- (b) Leads to a result which is manifestly absurd or unreasonable.”).

<sup>123</sup> See Vienna Convention on the Law of Treaties art. 31(3) (providing “[t]here shall be taken into account, together with the context:

- (a) Any subsequent agreement between the parties regarding the interpretation of the treaty or the application of its provisions;



dispute over the Argo Guidelines serves as only the latest example of the absence of a common understanding in this area.<sup>124</sup>

Customary international law also does not support the treatment of dual-purpose telecom-marine data cables as MSR. The position that such cables are MSR satisfies neither of the requirements of the classical definition of customary international law, stated as “international custom, as evidence of a general practice accepted as law.”<sup>125</sup> First, there is no evidence of a general practice, as there is not even any precedent of such actual regulation of an in-service cable by a coastal state. Second, in the absence of such precedent, there can be no concurrence of such precedents, much less general acceptance thereof or a recognition of an obligation to abide by such a precedent. Coastal states and commentators may have many reasons for asserting that telecom-marine data cables are MSR, but they have yet to persuade their peers that the view is universal or even the predominant one.

On the other hand, there is also no textual or international-custom support for the view that the submarine cable rights and freedoms extend to any and all functionality added or built into a cable beyond traditional telecommunications or to any device or equipment connected to or powered by submarine cables. As noted in chapter 3 above, the LOS Convention and earlier treaties do not define the term “submarine cable,” though the objective, purpose, and interpretation of this term and subsequent agreements strongly suggest that the term refers to cables used to transport voice, data, and Internet traffic between system end points.<sup>126</sup> Attempts to extend submarine-cable freedoms to such additional functionality would likely be rejected by some states<sup>127</sup> on the grounds that such interpretation constitutes abuse of rights granted by the LOS Convention.<sup>128</sup> Such attempts could also contribute to industry fears about a more general erosion of those freedoms, as discussed in paragraph 5.3 below.

## 5.2 Dual purpose telecom-marine data cables are likely to be permitted with few restrictions by some coastal states while treated as MSR by other coastal states

In the absence of agreed treaty interpretations or customary international law governing dual-purpose telecom-marine data cables, it is highly likely that coastal states will take differing legal-regulatory approaches to the concept of dual-purpose telecom-marine data cables. To understand the opportunities and challenges for such cables, the submarine cable industry and scientists should consider that there are easier cases and harder cases regarding the legal-regulatory treatment of telecom-marine data cables.

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(b) Any subsequent practice in the application of the treaty which establishes the agreement of the parties regarding its interpretation;

(c) Any relevant rules of international law applicable in the relations between the parties.”).

<sup>124</sup> See part IV.D above.

<sup>125</sup> Statute of the International Court of Justice, art. 38(1)(b). See also Shabtai Rosenne, *PRACTICE AND METHODS OF INTERNATIONAL LAW* (Oceana Publication, Inc., 1984) at 55 (stating that customary international law “consists of rules of law derived from the consistent conduct of States acting out of the belief that the law required them to act that way.”).

<sup>126</sup> See, e.g., Robert Beckman, *Submarine Cables – A Critically Important but Neglected Area of the Law of the Sea*, ISIL 7<sup>TH</sup> INT’L CONF. ON LEGAL REGIMES OF SEA, AIR, SPACE AND ANTARCTICA (Jan. 2010), <http://cil.nus.edu.sg/wp/wp-content/uploads/2010/01/Beckman-PDF-ISIL-Submarine-Cables-rev-8-Jan-10.pdf>.

<sup>127</sup> See, e.g., Strati at 14 (stating that the collection of oceanographic data “cannot be interpreted as inherent to the traditional freedom of laying submarine cables or as ‘an international use of the seas associated with the operation of submarine cables’ as provided for in article 58(1) of UNCLOS with respect to the EEZ.”).

<sup>128</sup> *Id.* (noting that “[t]here may even be room for claiming an ‘abuse of right,’ which is specifically prohibited by article 300 of UNCLOS, namely that ‘States Parties shall fulfil in good faith the obligations assumed under this Convention and shall exercise the rights, jurisdiction and freedoms recognized in this Convention in a manner which would not constitute an abuse of right’”).

### 5.2.1 Easier case 1: Deployments on the high seas and in the Area

The deployment, operation, and maintenance on the high seas and in the Area of telecom-marine data cables raises few, if any legal-regulatory issues. Such deployment, operation, and maintenance does not fall within the jurisdiction of any coastal state. These activities also do not fall within the jurisdiction of the ISA or other restrictions in Part XI of the LOS Convention, as they do not fall within the definition of “activities in the Area” because they do not involve the exploration or exploitation of living or non-living resources.<sup>129</sup>

### 5.2.2 Easier case 2: Deployments in the EEZs and continental shelf areas of coastal states that recognize the concept of operational oceanography

The deployment, operation, and maintenance of submarine telecommunications cables with scientific sensors in the EEZs and continental shelf areas of states that recognize the concept of operational oceanography raise few legal-regulatory issues. The United States, for example, would very likely treat the deployment, operation, and maintenance of telecom-marine data cables by foreign operators as operational oceanography exempt from MSR regulation.<sup>130</sup> As discussed in paragraph 4.1 above, the United States does not regulate as MSR the collection of marine meteorological data and other routine ocean observations, such as the Argo program.<sup>131</sup>

### 5.2.3 Easier case 3: Deployments in EEZs and continental shelf areas by domestic entities, regardless of whether activities are classified as operational oceanography or MSR

The consent requirements of the MSR regime apply only in situations where a foreign party seeks to conduct MSR, as explained in paragraph 4.1 above. To the extent that a cable operator is a domestic entity, the coastal-state consent requirements of Article 246 would not be triggered (though other domestic legal-regulatory requirements might still apply). Nevertheless, participation by foreign members in a consortium-owned cable system could provide a basis for a coastal state to insist that consent is required, as the LOS Convention’s consent provisions apply to “marine scientific research projects by other States or competent international organizations” or “of another State or competent international organization.”<sup>132</sup> The consortium members might try to work around this issue by designating a domestic consortium member as the cable’s landing party in the coastal state, or by structuring of ownership of the cable system segment within the coastal state’s EEZ or continental-shelf area.

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<sup>129</sup> Even if they were deemed marine scientific research, such deployment, operation, and maintenance would be subject to minimal obligations, such as international cooperation, promoting the benefits to less technologically-developed nations, and data dissemination. Nevertheless, only “State Parties” may conduct marine scientific research within the Area, meaning that states that have not ratified the LOS Convention would be barred from conducting such marine scientific research activities in the Area. See part IV.A.7 above.

<sup>130</sup> Any sensing equipment to be deployed would likely be reviewed as part of the “principal equipment list” in the national security review conducted by the “Team Telecom” agencies of the U.S. Government as part of the licensing process by the U.S. Federal Communications Commission. See Kent Bressie, *Continuing Challenges with National Security Reviews, Licensing, and Environmental Regulation*, Pacific Telecommunications Council 2011 (Honolulu, 18 Jan. 2011), at 4-11, [www.wiltshiregrannis.com/siteFiles/News/007ADBD538CEA53C7B5B0A6EF6C88283.pdf](http://www.wiltshiregrannis.com/siteFiles/News/007ADBD538CEA53C7B5B0A6EF6C88283.pdf).

<sup>131</sup> If such activities were deemed MSR, the cable/sensor owner and/or its contractors would – if they were not U.S. persons or entities – need to obtain the prior consent of the U.S. Government, as the United States requires consent for MSR activities that touch the continental shelf. See part IV.A.2 above.

<sup>132</sup> See LOS Convention, art. 246(3), (5). See also UN MSR Guide, Annex I, Draft standard form A – Application for consent to conduct marine scientific research (requesting information regarding the sponsoring institution, the scientist in charge of the project, and the scientist’s country).

#### 5.2.4 Harder case 1: coastal state regulates deployment and operation of sensors in EEZs and continental shelf areas as MSR

Certain coastal states will likely classify sensors on submarine telecommunications cables – whether landing in, or merely transiting the EEZs or continental-shelf areas of, those states – as MSR. Like all states, coastal states seek to maximize economic resources, safeguard national security, and maximize leverage in territorial disputes. Coastal states have a long history of seeking to achieve these ends through excessive jurisdictional assertions, though such assertions are often challenged by other states.<sup>133</sup> For coastal states so inclined, the temptation to regulate telecom-marine data cables may prove irresistible, particularly when they believe that the resulting data themselves may prove valuable.<sup>134</sup>

Coastal states could do so on a variety of theories: (i) sensors on telecom-marine data cables constitute MSR installations and equipment; (ii) the installation, operation, and maintenance of sensors on telecom-marine data cables constitutes MSR; and (iii) related cable-ship activities also constitute MSR. Coastal states could also assert the presence of “exceptional circumstances” that would preclude or delay the installation or maintenance of submarine cables on the grounds that: (i) the presence of submarine cables on the seabed uses or exploits the resources of the seabed; (ii) installation and maintenance operations introduce harmful substances into the marine environment; and/or (iii) the cable and sensors are an installation or structure used for exploration or exploitation of living or nonliving natural resources or for other economic purposes.<sup>135</sup> At various times, governments have asserted that submarine cables do all of these things, even in the absence of scientific sensors.

Attempts by coastal states to regulate foreign telecom-marine data cables as MSR – or force the ISA to do the same – would almost certainly preclude the deployment of sensors in the EEZ or continental shelf areas of such states. *First*, the timing requirements for MSR consents are incompatible with time-to-market considerations for installation of submarine cables and with the vagaries of the installation process (e.g., weather windows and protected fishing seasons). The timing requirements are also incompatible with the need for near-real-time repairs of submarine cables. *Second*, it is unclear whether the cable owner, the cable ship owner, or both would need to seek MSR consents via their national governments, or whether the use of a domestically-incorporated subsidiary or domestically-flagged cable ship for engagement in such activities would help to avoid the MSR consent requirements, which apply only to foreign states and their commercial entities. Such uncertainty would likely cause further delay. *Third*, the data dissemination obligations arising from treatment as MSR would conflict with the economic model proposed by some for telecom-marine data cables, which depend on a paying customer for the data. Data dissemination restrictions arising from treatment as MSR would similarly interfere with such a business model and undermine the timeliness of the data – one of the principal selling points of sensors on submarine cables. *Fourth*, the above-mentioned concerns would only become more acute with the recognition of extended continental shelf areas, which will expand coastal-state authority to a greater percentage of the world’s oceans. *Fifth*, the technology-transfer provisions of Article 144 could lead undersea cable manufacturers and suppliers to decline to participate in such projects for fear of losing control of their intellectual property.

In fact, coastal states have attempted to regulate submarine cable activities as MSR even in the absence of scientific sensors. Coastal states have long tried to assert that national laws and regulations bar foreign-flagged vessels from EEZs or require use of local contractors for the conduct of submarine cable route surveys, on the grounds that such activities are MSR and reserved for domestic entities. In doing so, coastal

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<sup>133</sup> See, e.g., J. Ashley Roach and Robert W. Smith, UNITED STATES RESPONSES TO EXCESSIVE MARITIME CLAIMS (Martinus Nijhoff Publishers, 2d ed. 1996).

<sup>134</sup> See, e.g., Strati at 12 (calling the availability and accessibility of data a “major” concern for coastal States, especially transit States”).

<sup>135</sup> See LOS Convention, art. 246(5).

states and their commercial enterprises have caused significant permitting delays and imposed fees on submarine cable operators.

### **5.2.5 Harder case 2: Coastal state regulates entire cable as MSR on theory that sensors anywhere deployed “taint” the entire cable**

There remains the possibility that a coastal state in which a particular submarine cable system lands could take the position that the deployment of sensors on portions of a submarine cable on the high seas would render the entire length of the submarine cable system and all of the sensors as a MSR activity subject to the coastal state’s consent. Such a “tainting” theory – that any marine data collection capability anywhere renders the entire endeavor as subject to the most restrictive treaty provisions governing MSR – is wholly unreasonable and is not supported by the text of the LOS Convention. Such a view would entirely negate the rights and freedoms accorded to submarine cables, as established explicitly by treaty and established in customary international law.<sup>136</sup> Nowhere does the LOS Convention suggest that a mere comingling of activities would negate such rights. Consequently, other coastal states would have grounds for claiming an abuse of rights pursuant to Article 300 of the LOS Convention. Dual-purpose telecom-marine data cables have both submarine-cable and marine data collection attributes, and the legal-regulatory consequences of those attributes should be considered under the relevant legal-regulatory regimes, respectively.

## **5.3 The potential for erosion of submarine cable rights and freedom**

The undersea cable industry and some governments are rightly concerned about guarding against erosion of the unique rights and freedoms accorded to submarine cables. Fundamentally, these parties are concerned both that the dual use of submarine cables for telecommunications and marine data collection would encourage even more aggressive jurisdictional assertions over submarine cables, which, if widespread, could provide a basis for new treaty interpretations or customary international law. Such actions by coastal states could impose significant costs and delays on the installation and maintenance of submarine cables and – particularly in the maintenance context – threaten the reliability of communications transported by such cables. Such concerns are well-founded, but they should not be overstated or over-generalized.

A number of coastal states have already made excessive assertions of jurisdiction, and these states are likely to continue to make such assertions, regardless of whether or not dual-purpose telecom-marine data cables are deployed off their coasts or more generally. Many of these coastal-state actions are premised on a misreading of LOS Convention Articles 60(1) and 80, which grants the coastal state the exclusive right to construct and authorize construction of: (i) artificial islands; (ii) installations and structures for the purpose of exploring, exploiting, or conserving living or non-living natural resources or for other economic purposes, but not submarine cables or MSR, which are treated separately in the LOS Convention Articles 58 and 79 and Part XIII; and (iii) installations and structures which may interfere with the coastal states exercise of rights in the EEZ or continental-shelf area.<sup>137</sup> For such artificial islands, installations, and structures, the LOS Convention also grants the coastal state jurisdiction with respect to customs, fiscal, health, safety, and immigration laws and regulations.<sup>138</sup>

For example, China imposes permitting requirements for submarine cable installation and repair within its EEZ and continental shelf areas.<sup>139</sup> India has sought to impose customs duties on all submarine cable

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<sup>136</sup> See part II above.

<sup>137</sup> See part II above.

<sup>138</sup> LOS Convention art. 60(2).

<sup>139</sup> See People’s Republic of China, Provisions Governing the Laying of Submarine Cables and Pipelines, Decree No. 27, State Council, 32d. Executive Meeting (effective 1 Mar. 1989); People’s Republic of China, Measures of the State Oceanic Administration for the Implementation of the Administrative Provisions Governing the Laying of Submarine Cables and Pipelines, Order No. 3, State Oceanic Administration (26 Aug. 1992).

equipment “imported” into the Indian EEZ, assess customs duties on services provided within the Indian EEZ, and assess a services tax on submarine cable project value to the limit of the Indian EEZ.<sup>140</sup> Malta had sought to impose a tax on submarine cables transiting its EEZ.<sup>141</sup> Moreover, as noted in paragraph 5.2.4 above, coastal states also already assert that some submarine cable-related activities constitute MSR. Consequently, the focus should remain on whether and where deployment and operation of telecom-marine data cables would incite coastal states to assert jurisdiction whereas previously they might not have done so.

#### 5.4 A way forward

In the near term, the deployment and operation of telecom-marine data cables is most likely to occur in circumstances such as the “easier cases” outlined in paragraph 5.2 above. The absence of consensus regarding coastal-state jurisdiction over marine data collection makes the prospect of international agreements and standards in this area very unlikely.

Moreover, any attempt to impose on submarine cable operators a uniform global approach regarding scientific sensors – if such an approach were even possible – would likely doom the deployment of such cables. Support from the scientific community would be insufficient. For the deployment of telecom-marine data cables to succeed, submarine cable operators and suppliers must determine whether they have sufficient legal-regulatory flexibility and a business case for such deployments.

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<sup>140</sup> See Kent Bressie, *What Might the Future Hold for Undersea Cable Regulation?*, Pacific Telecommunications Council 2012 (Honolulu, 17 Jan. 2012) at 17 [www.wiltshiregrannis.com/siteFiles/News/92F8909D549AB6FB779EBBA5B969CB7E.pdf](http://www.wiltshiregrannis.com/siteFiles/News/92F8909D549AB6FB779EBBA5B969CB7E.pdf); Ministry of Finance: Dep’t of Revenue, NOTIFICATION No. 1/2002 – Service Tax, as modified by Notification 21/2009 (extending the service tax to “installations, structures and vessels in the continental shelf of India and the exclusive economic zone of India”). Of course, the WTO General Agreement on Tariffs and Trade, to which India is a party, permits the assessment of customs duties only on goods. Indian law also limits the assessment of duties to the territorial sea, unless minerals extraction is involved. See Indian Customs Law § 2(27) (granting jurisdiction only over the territorial sea); Indian Customs Circular No. 17/2002 (stating that the collection of customs duties in the EEZ is expressly limited to minerals extraction and goods imported into the EEZ in support of such activities). The collection of duties and service tax on the same value appears to be an unfair double-collection.

<sup>141</sup> See Robert Beckman and Tara Davenport, *Workshop Report, WORKSHOP ON SUBMARINE CABLES AND THE LAW OF THE SEA* (2009), <http://cil.nus.edu.sg/wp/wp-content/uploads/2009/10/Workshop-Report-29-Jan-2010.pdf>.

## Glossary

<b>EEZ</b>	Exclusive economic zone
<b>ICPC</b>	International Cable Protection Committee
<b>IOC</b>	Intergovernmental Oceanographic Commission
<b>ISA</b>	International Seabed Authority
<b>LOS Convention</b>	United Nations Convention on the Law of the Sea
<b>MSR</b>	Marine scientific research
<b>OPRF</b>	Ocean Policy Research Foundation
<b>UNCLOS</b>	United Nations Convention on the Law of the Sea
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>WTO</b>	World Trade Organization

## Bibliography

- Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (1994).
- Argo, *Current Status of Argo*, [www.argo.ucsd.edu/About\\_Argo.html](http://www.argo.ucsd.edu/About_Argo.html) (last visited 28 Mar. 2012).
- Argo, *Organization*, [www.argo.ucsd.edu/Organisation.html](http://www.argo.ucsd.edu/Organisation.html) (last visited 28 Mar. 2012).
- Sam Bateman, *Hydrographic Surveying in the Exclusive Economic Zones*, 5 *International Hydrographic Review* 76 (2004).
- Sam Bateman, *A Response to Pedrozo: The Wider Utility of Hydrographic Surveys*, 10 *Chinese Journal Int'l Law* 177 (2011).
- Robert Beckman, *Submarine Cables – A Critically Important but Neglected Area of the Law of the Sea*, ISIL 7th Int'l Conf. on Legal Regimes of Sea, Air, Space and Antarctica (Jan. 2010), <http://cil.nus.edu.sg/wp/wp-content/uploads/2010/01/Beckman-PDF-ISIL-Submarine-Cables-rev-8-Jan-10.pdf>.
- Robert Beckman and Tara Davenport, *Workshop Report*, Workshop on Submarine Cables and the Law of the Sea (2009), <http://cil.nus.edu.sg/wp/wp-content/uploads/2009/10/Workshop-Report-29-Jan-2010.pdf>.
- Katharina Bork, Johannes Karstensen, and Martin Visbeck, *The Legal Regulation of Floats and Gliders – In Quest of a New Regime?*, 39 *Ocean Development & Int'l Law* 298 (2008).
- Kent Bressie, *Continuing Challenges with National Security Reviews, Licensing, and Environmental Regulation*, Pacific Telecommunications Council 2011 (Honolulu, 18 Jan. 2011), [www.wiltshiregrannis.com/siteFiles/News/007ADBD538CEA53C7B5B0A6EF6C88283.pdf](http://www.wiltshiregrannis.com/siteFiles/News/007ADBD538CEA53C7B5B0A6EF6C88283.pdf).
- Kent Bressie, *Improper Regulation of Undersea Cable Activities as “Marine Scientific Research,”* International Cable Protection Committee Plenary Meeting (Apr. 22, 2009), [www.wiltshiregrannis.com/siteFiles/News/22873CC28312196005574E4B428F4C64.pdf](http://www.wiltshiregrannis.com/siteFiles/News/22873CC28312196005574E4B428F4C64.pdf).
- Kent Bressie, *What Might the Future Hold for Undersea Cable Regulation?*, Pacific Telecommunications Council 2012 (Honolulu, 17 Jan. 2012), [www.wiltshiregrannis.com/siteFiles/News/92F8909D549AB6FB779EBBA5B969CB7E.pdf](http://www.wiltshiregrannis.com/siteFiles/News/92F8909D549AB6FB779EBBA5B969CB7E.pdf).
- Ian M. Brownlie, *Principles of Public International Law* (Oxford, 5th ed. 1998).
- Douglas Burnett, *Cable Route Surveys Are Not Marine Scientific Research*, SubTel Forum No. 43 (Mar. 2009).
- Douglas Burnett, *Understanding the Differences Under UNCLOS Between Submarine Cables and Marine Scientific Research*, ITU 2011 Green Standards Week Workshop on Submarine Cables for Ocean/Climate Monitoring and Disaster Warning: Science, Engineering, Business and Law (9 Sept. 2011).
- Call to Action*, Workshop on Submarine Cables for Ocean/Climate Monitoring and Disaster Warning: Science, Engineering, Business and Law (Rome, 9 Sept. 2011), [www.itu.int/dms\\_pub/itu-t/oth/4B/04/T4B040000080001MSWE.docx](http://www.itu.int/dms_pub/itu-t/oth/4B/04/T4B040000080001MSWE.docx).
- Central Intelligence Agency, *Maritime Claims*, World Factbook, <https://www.cia.gov/library/publications/the-world-factbook/fields/2106.html> (last updated 23 Mar. 2012).
- Convention for the Protection of Submarine Telegraph Cables, Mar. 14, 1884, T.S. 380.

*Decision regarding the date of commencement of the ten-year period for making submissions to the Commission on the Limits of the Continental Shelf set out in article 4 of Annex II to the United Nations Convention on the Law of the Sea*, United Nations Convention on the Law of the Sea Meeting of States Parties, SPLOS/72 (29 May 2001), available at

<http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N01/387/64/PDF/N0138764.pdf?OpenElement>.

Delimitation of the Maritime Boundary of the Gulf of Maine (Canada/United States), 1984 I.C.J Rep. 246.

René Jean Dupuy and Daniel Vignes, *A Handbook on the New Law of the Sea*, (Kluwer Academic Publishers, 1993).

EGS Group, *EGS Submarine Cable Services*,

[www.egssurvey.com/pdf/services/sector\\_egs%20cable%20services.pdf](http://www.egssurvey.com/pdf/services/sector_egs%20cable%20services.pdf) (last visited 28 Mar. 2012).

Final Act of the Third United Nations Conference on the Law of the Sea, Annex II – Commission on the Limits of the Continental Shelf.

Fugro NV, *Marine Surveys*, [www.fugro.com/datasheets/services/Marine%20Surveys.pdf](http://www.fugro.com/datasheets/services/Marine%20Surveys.pdf) (last visited 28 Mar. 2012).

Geneva Convention on the Continental Shelf, Apr. 29, 1958, 499 U.N.T.S. 311.

Geneva Convention on the High Seas, April 29, 1958, 450 U.N.T.S. 82.

*Guidelines for the Implementation of Resolution XX-6 of the IOC Assembly Regarding the Deployment of Profiling Floats in the High Seas Within the Framework of the Argo Program*, IOC Res. EC-XLI.4, Annex II, Executive Council, 41<sup>st</sup> Sess. (29 July 2008), <http://unesdoc.unesco.org/images/0017/001798/179861e.pdf>.

Indian Customs Circular No. 17/2002.

Indian Customs Law § 2(27).

India, Ministry of Finance (Dep't of Revenue) Notification No. 1/2002 – Service Tax.

India, Ministry of Finance (Dep't of Revenue) Notification 21/2009.

International Cable Protection Committee Recommendation No. 2, available from the International Cable Protection Committee at [www.iscpc.org](http://www.iscpc.org).

International Hydrographic Bureau, *A Manual on Technical Aspects of the United Nations Law of the Sea Convention – 1982*, Special Pub No. 51 (4th ed. 2006).

Nathalie Klein, *Maritime Security and the Law of the Sea* (Oxford, 2011).

Maurice E. Kordahi, *New Tools for Multilayered Undersea Telecommunication Networks*, Sea Technology Magazine 51, No. 7 (2010).

*The Law of the Sea: Marine Scientific Research - A revised guide to the implementation of the relevant provisions of the United Nations Convention on the Law of the Sea*, Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs, United Nations (2010).

Aurora Mateos and Montserrat Gorina-Ysern, *Climate Change and Guidelines for Argo Profiling Float Deployment on the High Seas*, ASIL Insight, Vol. 14, No. 8 (8 Apr. 2010).



Ocean Policy Research Foundation, *Guidelines for Navigation and Overflight in the Exclusive Economic Zone*, EEZ Group 21 (2005).

“Old Phone Cables Open Seabed to Science,” *The New York Times* (24 Aug. 1999).

People’s Republic of China, Measures of the State Oceanic Administration for the Implementation of the Administrative Provisions Governing the Laying of Submarine Cables and Pipelines, Order No. 3, State Oceanic Administration (26 Aug. 1992).

People’s Republic of China, Provisions Governing the Laying of Submarine Cables and Pipelines, Decree No. 27, State Council, 32d Executive Meeting (effective Mar. 1, 1989).

People’s Republic of China, Surveying and Mapping Law, art. 7 (Dec. 1, 2002) <http://en.sbsm.gov.cn/article//LawsandRules/Laws/200710/20071000003241.shtml>.

Georgianne Purvinis et al., *Global Deep Ocean Sensor Network on Submarine Cables*, Oceans ’08 MTS/IEEE Kobe Techno Ocean Conference Proceedings (28 May 2008).

Report of the Chairman of the Third Committee, *Official Records of the 134th Plenary of the Resumed Ninth Session of the Third United Nations Conference on the Law of the Sea*, vol. 14, U.N. Doc. A/CONF.62/L.61 at 134 (Aug. 25, 1980).

Shabtai Rosenne, *Practice and Methods of International Law* (Oceana Publication, Inc., 1984).

J. Ashley Roach, *Marine Data Collection: Methods and the Law in Freedom of the Seas, Passage Rights, and the 1982 Law of the Sea Convention* (Myron H. Nordquist, Tommy T.B. Koh, and John Norton Moore eds., Martinus Nijhoff Publishers, 2009).

J. Ashley Roach and Robert W. Smith, *United States Responses to Excessive Maritime Claims* (Martinus Nijhoff Publishers, 2d ed. 1996).

Peter Ryder, *A possible migration from marine scientific research to operational oceanography in the context of the United Nations Convention on the Law of the Sea* in *Building the European Capacity in Operational Oceanography*, Proceedings of the Third International Conference on EuroGOOS (H. Dahlin et al. eds., Elsevier B.V., 2003).

Yuichi Shirasaki et al., *Study on ocean observatories by re-use of retired optical submarine cable*, Oceans ’04 MTS-IEEE Techno-Ocean 2004 Conference Proceedings (14 Mar. 2005).

Alfred H.A. Soons, *Marine Scientific Research and the Law of the Sea* (Kluwer Law and Taxation Publishers, 1982).

Statute of the International Court of Justice.

Anastasia Strati, Ministry of Foreign Affairs, Greece, *The Law – Existing rules and new challenges*, ITU 2011 Green Standards Week Workshop on Submarine Cables for Ocean/Climate Monitoring and Disaster Warning: Science, Engineering, Business and Law (Rome, 9 Sept. 2011).

*Submarine Cables and the Oceans – Connecting the World*, UNEP-WCMC Biodiversity Series No. 31 (UNEP-WCMC and ICPC, 2009).

Tyco Electronics Subsea Communications, LLC, *Route Survey*, [www.subcom.com/process/design/route-survey.aspx](http://www.subcom.com/process/design/route-survey.aspx) (last visited Mar. 28, 2012).

UNESCO Convention on the Protection of the Underwater Cultural Heritage (2 Nov. 2001), *reprinted in* 41 I.L.M. 37 (2002).

United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397 (entered into force on Nov. 16, 1994).

United Nations Convention On The Law Of The Sea 1982 - A Commentary, vol. IV (Myron H. Nordquist et al. eds., Martinus Nijhoff Publishers, 1991).

United Nations Department of Oceans and Law of the Sea, Office of Legal Affairs, *Maritime Space: Maritime Zones and Maritime Delimitations – Frequently Asked Questions* (responding to Question #7, “What regime applies to the cables and pipelines?”), [www.un.org/Depts/los/LEGISLATIONANDTREATIES/frequently\\_asked\\_questions.htm](http://www.un.org/Depts/los/LEGISLATIONANDTREATIES/frequently_asked_questions.htm) (last visited Mar. 28, 2012).

United Nations Department of Oceans and Law of the Sea, *Submissions, through the Secretary-General of the United Nations, to the Commission on the Limits of the Continental Shelf, pursuant to article 76, paragraph 8, of the United Nations Convention on the Law of the Sea of 10 December 1982*, [www.un.org/Depts/los/clcs\\_new/commission\\_submissions.htm](http://www.un.org/Depts/los/clcs_new/commission_submissions.htm) (last modified 18 Jan. 2012).

United States Department of State, *Marine Scientific Research Authorizations*, [www.state.gov/e/oes/ocns/opa/rvc/index.htm](http://www.state.gov/e/oes/ocns/opa/rvc/index.htm) (last visited 28 Mar. 2012). United States of America, Presidential Proclamation No. 5030 (10 Mar. 1983), 48 Fed. Reg. 10,605 (14 Mar. 1983).

United States of America, President Ronald Reagan, Statement on United States Oceans Policy (10 Mar. 1983).

United States of America, Presidential Proclamation No. 7219 (2 Aug. 1999), 64 Fed. Reg. 48,701 (2 Aug. 1999).

Vienna Convention on the Law of Treaties, 1155 U.N.T.S. 331 (entered into force 27 Jan. 1980).

World Trade Organization, Services Database, <http://tsdb.wto.org>.

Yuzhu You, *Using Submarine Communications Networks to Monitor Climate Change*, ITU Technology Watch Report (Nov. 2010).



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