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THE OCEAN
CLEANUP

Memo

The Ocean Cleanup project as Marine Scientific Research

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Summary

This memo studies the possibility of qualifying The Ocean Cleanup activities on the high seas as marine scientific research. The study provides an overview of the legal aspects of marine scientific research in treaties, case law and literature, and applies these on the activities of The Ocean Cleanup. It particularly focusses on the marine scientific research status under the Dutch flag. We conclude that such status is very well possible, especially in the pilot phase and first experimental deployment of The Ocean Cleanup activities on the high seas.

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Introduction

This research was commissioned by The Ocean Cleanup to the Leiden Advocacy Project on Plastic (LAPP). Legal counsel Bettina Boschen asked LAPP to study the definition of marine scientific research (MSR) and the question whether and how The Ocean Cleanup could be defined as such. The Study on the International Legal Framework for the Operation of The Ocean Cleanup Array (the Study) by Bettina Boschen and Alex Oude Elferink is taken as starting point for our research.¹

When starting this research for this memo, the design for the array of The Ocean Cleanup consisted of a series of large, interlinked barriers intended to float in the area on the high seas, and in particular in the area of the North Pacific Gyre situated in the Northern Pacific Ocean. The original design for the array included a two-arm barrier with buoys moored to the seabed. The length of the array measured up to a 100 km with in the middle a collection station, based on a spar buoy platform.

In June 2016 a prototype was released and deployed on the North Sea to put the barrier boom to the test of ‘survivability in extreme conditions and for its plastic capturing abilities’ and to gain experience in ocean deployment. After two months the experiment was ended due to damage to the barrier

In May 2017 The Ocean Cleanup revealed an adapted design. The idea of a moored barrier was departed, while the size was scaled down. The new design involves multiple floating systems with deep sea anchors moving slowly with the currents. No platform will be attached and a support vessel will collect the plastic once full.

Cleanup trials are set at the end of 2017 at the North Pacific. These trials will involve several tests to assess the systems stability and behavior. Based on the results of these tests, the system will be improved until it operates as intended. A first fully functioning system is envisaged to deploy in mid-2018, and dependent of results and funding, the roll out to full-scale deployment of the project should be finished in 2020.

This memo includes information given on the website, during events and in press releases as well as during meetings with Bettina Boschen and Ellen Hoogland, as well as the Study. Part I of the memo will describe the law concerning MSR. It will try to provide a definition of MSR and expand on the rights and obligations specific for MSR. Part II will

¹ Bettina Boschen, AG Oude Elferink, *Study on the international legal framework for the operation of an Ocean Cleanup array*, (NILOS 2016) 4.

explore whether and in which way the activities of The Ocean Cleanup can qualify as MSR and which steps have to be taken.

PART I

Defining Marine Scientific Research

Only states have a right to conduct MSR

According to Article 87 of the United Nations Law Of the Sea Convention (LOSC), states have the right the right to conduct scientific research with due regard for the interest of other states in their exercise of the freedom of the high seas.² The right to conduct scientific research is thus awarded to states, not individuals, and individuals or private institutions should derive their ‘right to conduct scientific research’ from the rights of a state. As The Ocean Cleanup is a private initiative in the form of a Dutch foundation, it has to conduct marine scientific research under the umbrella of a state to be able to legitimise its installation as conducting scientific research. As the Dutch government, through its ministries of Infrastructure & the Environment and Economic Affairs has contributed financially to the North Sea prototype, there is a legitimate expectation that the Dutch government is willing to endorse The Ocean Cleanup under its authority. We will now look into the definition of MSR to assess whether the activities of The Ocean Cleanup can be seen as MSR.

MSR and scientific research in LOSC

Article 87(1)(f) of LOSC includes the freedom of ‘scientific research’ in the high seas, while Article 257 provides a right to conduct MSR in the water column beyond national jurisdiction. The term scientific research is broader than MSR which directs to knowledge of the marine environment. Accordingly, scientific research can be carried out on the high seas without being marine in nature.³ MSR was not regulated in the Convention on the High Seas of 1958.⁴

² The United Nations Convention on the Law of the Sea (adopted 10 December 1982, entered into force 16 November 1994) 4 UNTS 275, art 87; see Myron H Nordquist, Shabtai Rosenne and Neal R Grandy, *United Nations Convention on The Law of The Sea 1982: A Commentary* (Martinus Nijhoff Publishers 1991), 448.

³ Philoméne Verlaan, ‘Marine Scientific Research: Its Potential Contribution to Achieving Responsible High Seas Governance’ in David Freestone, *The 1982 Law of the Sea Convention at 30: Successes, Challenges and New Agendas* (Brill, 2013), 5; Philoméne Verlaan, ‘Current Legal Developments: London Convention and London Protocol’ (2011) 26 *IJMCL* 185–194; Division for Ocean Affairs and the Law of the Sea Office of Legal Affairs, *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* (United Nations, New York 2010), 16 [56] (Revised Guide).

⁴ Convention on the High Seas (adopted 29 April 1958, entered into force 30 September 1962) 450 UNTS 11.

However, in its sister treaty, the Convention on the Continental Shelf, Article 5 refers to ‘fundamental oceanographic or other scientific research carried out with the intention of open publication’ which should not be interfered with by exploration activities.⁵

Wegelein observes that from the perspective of MSR the legal delineation of certain zones of the oceans does not make sense, as the objectives of the research constantly move and interchange, and the oceans are in the end part of one system.⁶ Therefore, research often requires access to different geographical regions. Nevertheless, LOSC does distinguish between the different zones in Part XIII, and attaches different legal regimes to the zones. Most importantly, in the territorial waters and EEZ the consent of coastal states is required. Article 21 seems to distinguish between marine scientific research and hydrographic surveys in the context of innocent passage, but generally hydrographic surveys are seen as a kind of marine scientific research.⁷

Defining MSR

The terms scientific research and marine scientific research (MSR) are not defined in the LOSC.⁸ Part XIII of LOSC regulates MSR in seventeen articles. Article 240 gives initial guidance as it states that MSR should be conducted for peaceful purposes and with appropriate scientific methods and means. Further guidance is provided by the United Nations (UN) Division for Ocean Affairs and the Law of the Sea in its guide of 2010.⁹ It refers to the drafting history of LOSC and an important observation is that it was difficult to distinguish between research directed towards the exploration and exploitation of marine resources and so-called ‘pure scientific research’. Also concerns regarding research for security and espionage purposes were raised.¹⁰ Attempts to differentiate between fundamental research and applied research failed, as the dividing line between the two forms of research seemed to be too difficult to settle.¹¹ Wegelein provides some guidance by pointing to the objective of the research

⁵ Convention on the Continental Shelf (adopted 29 April 1958, entered into force 10 June 1964) 499 UNTS 311.

⁶ Florian HTh Wegelein, *Marine Scientific Research: The Operation and Status of Research Vessels and Other Platforms in International Law* (Martinus Nijhoff Publishers 2005), 17.

⁷ See Definition of Hydrography, <http://www.iho.int/> and Wegelein (n 6) 15. Wegelein however suggests at page 81 that hydrographic survey may not fall within the definition of MSR, and therefore no consent from coastal states is necessary, Wegelein (n 6), 81.

⁸ Verlaan (n 3) 131, 132.

⁹ Revised Guide (n 3), 4, 15, 32. See Revised Single Negotiating Text (RSNT), 6 May 1976, Doc. A/CONF/62/WP. 8/Rev. 1/Part III, reprinted in Third United Nations Conference on the Law of the Sea, Official Records (‘UNCLOSOR’), vol V, article 48, p 173 – superseded by the Informal Composite Negotiating Text (ICNT), 15 July 1977, Doc. A/CONF/62/WP. 10, UNCLOSOR, vol. VIII, p 1.

¹⁰ Wegelein (n 6), 67.

¹¹ Wegelein (n 6), 70.

project: curiosity as the main objective or also its utility for a certain purpose.¹² However, what may have seemed fundamental may turn to be useful for exploitation.¹³ And the other way around: research that was done with an outlook of exploitation may result in valuable data for ‘fundamental’ research projects. In the Second and Third United Nations Conferences on the Law of the Sea it was brought forward that MSR should mean any study of related experimental work with the object of increasing mankind’s knowledge of the marine environment including its resources, however this definition was not adopted in the text of LOSC.¹⁴ The result of the negotiations towards LOSC was MSR remained undefined, making it as broad as possible to fit in all kinds of research projects.

MSR in case law

Subsequently, judicial institutions, organizations, committees and academics have been faced with the question what marine scientific research is. In the *Whaling* case the International Court of Justice Australia challenged the scientific research programme of Japan. Japan had authorized the killing of whales for scientific reasons. The question arose whether Japan’s programme could be qualified as scientific research in the meaning of Article VIII of the International Convention for the Regulation of Whaling (Whaling Convention). Australia argued that scientific research in the context of the Whaling Convention should have four essential characteristics: ‘defined and achievable objectives (questions or hypotheses) that aim to contribute to knowledge important to the conservation and management of stocks; ‘appropriate methods’, including the use of lethal methods only where the objectives of the research cannot be achieved by any other means; peer review; and the avoidance of adverse effects on stock.’¹⁵ The Court confirmed that there is some consensus about the role of hypotheses in scientific research. Moreover, the use of lethal methods in MSR was foreseen by the Whaling Convention, but not necessarily only when there are no other means. It also

¹² Wegelein (n 6), 71.

¹³ *ibid.*

¹⁴ See *Official Records of the General Assembly, Twenty-seventh Session, Supplement No.21, (A/8721)*, documents annexed to Part IV, document A/AC.138/SC.III/L.18 (Canada), Preamble, para 2, principle 2; Committee on the Peaceful Uses of the Seabed and the Ocean Floor beyond the Limits of National Jurisdiction, vol. 8, Subcommittee III, A/AC.138/SC.III/L.31 (Bulgaria, Poland, Ukrainian SSR and USSR), arts 1 and 2; *Official Records of the Third United Nations Conference on the Law of the Sea*, vol. II (United Nations publication, Sales No. E.75.V.5), paras 11 and 19. See Anna-Maria Hubert, ‘The New Paradigm in Marine Scientific Research: Regulating the Potential Environmental Impacts of Conducting Ocean Science’ (2011) 42 *Ocean Development & International Law* 329, 330; Patricia Birnie, ‘Law of the Sea and Ocean Resources: Implications for Marine Scientific Research’ (1995) 10 *International Journal of Marine and Coastal Law* 229, 242.

¹⁵ ICJ, *Whaling in the Antarctic (Australia v. Japan: New Zealand intervening)*, Judgment, [74].

pointed out that peer review was not requested under the Whaling Convention. The Court concluded that there was no need to define ‘scientific research’ as such. It continued to assess ‘whether the elements of a programme’s design and implementation are reasonable in relation to its stated scientific objectives. [S]uch elements may include: decisions regarding the use of lethal methods; the scale of the programme’s use of lethal sampling; the methodology used to select sample sizes; a comparison of the target sample sizes and the actual take; the time frame associated with a programme the programme’s scientific output; and the degree to which a programme co-ordinates its activities with related research projects.’¹⁶ The Court made the following remark:

The Court observes that a State often seeks to accomplish more than one goal when it pursues a particular policy. Moreover, an objective test of whether a programme is for purposes of scientific research does not turn on the intentions of individual government officials, but rather on whether the design and implementation of a programme are reasonable in relation to achieving the stated research objectives. [...] The research objectives alone must be sufficient to justify the programme as designed and implemented.¹⁷

A research project may thus have certain side effects, or even have more than one goal. Important is that the research objectives validate the activities that are carried out.

In 1958 in the *Aegean Sea* case, the ICJ stated in the Order of 11 September 1976 that Turkey had to refrain from any activity in the disputed area.¹⁸ Counsel for Greece, O’Connell, touched upon the difference between scientific research and exploration, *in casu* the search for oil on the continental shelf, as a Turkey’s ship was carrying out seismic research. He concluded that ‘only after investigation has been made and the results have been published is it possible to say whether the action is exploration or scientific research.’¹⁹ In several other ICJ cases scientific research was mentioned, but not defined or described.²⁰ Also within the case law of the

¹⁶ *Whaling case* (n 15) [88].

¹⁷ *Whaling case* (n 15) [97].

¹⁸ ICJ, *Aegean Sea Continental Shelf (Greece v. Turkey)*, Order of 11 September 1976 Request for the Indication of Interim Measures of Protection.

¹⁹ *Aegean Sea Continental Shelf* (n 18) [108-110] (Counsel O’Connell).

²⁰ See for an overview of case law on MSR, Barbara Kwiatkowska, *Decisions of the World Court relevant to the UN Convention on the Law of the Sea: a reference guide* (Kluwer 2002) 172-175.

International Tribunal for the Law of the Sea MSR is mentioned several times, but in none of the cases MSR is defined.²¹

The recent *Chagos* case dealt with the establishment of a marine protected area around the Chagos Archipelago, a group of islands administered by the UK in the Indian Ocean.²² According to the UK, this protected area could stimulate marine scientific research. Since there was no need to define marine scientific research, the issue was not dealt with by the tribunal. Recapitulating the case law on MSR, only the *Whaling* case rendered by the ICJ has shed some light on the definition and content of MSR. The Court concluded that although a research programme may have several goals, the research objectives alone should justify the activities that are carried out. It further pointed to elements that may play a role in deciding whether activities fitted in the definition of MSR: the scale of the programme, methodology, time frame, scientific output, and coordination with other scientific programmes.

MSR in documents of UN bodies and other intergovernmental organizations

The UN Committee on The Peaceful Uses of The Sea-Bed and Ocean Floor Beyond the Limits of National Jurisdiction was established in 1968 to study the elaboration of legal principles and norms which would promote international cooperation in the exploration and the use of the seabed and ocean floor, and to make recommendations to the General Assembly thereon. According the Committee the objectives of MSR should include the achievement of a level of understanding which allows accurate assessment and prediction of oceanic processes.²³ In 1991, the UN Division for Ocean Affairs and the Law of the Sea composed a guide for implementation of Part XIII LOSC, which was revised in 2010.²⁴ It gives an overview of the negotiations on a definition of MSR, but concludes that no agreement could be reached and no definition was included in the text of the convention.²⁵

The Commission on the Limits of the Continental Shelf (CLCS), established on the basis of Article 76 of LOSC, adopted the Rules of Procedure and the Scientific and Technical

²¹ See e.g. ITLOS, *The M/V "SAIGA" (No. 2) Case (Saint Vincent and the Grenadines v. Guinea)*, Judgment of 1 July 1999, Separate opinion of Judge Laing, [32, 49].

²² PCA, *Chagos Marine Protected Area Arbitration (Mauritius v. United Kingdom)*, Award 18 March 2015.

²³ United Nations GA, *Committee on The Peaceful Uses of The Sea-Bed and Ocean Floor Beyond the Limits of National Jurisdiction, Sub-Committee III*, (25 July 1972) (Working Paper submitted by the Canadian Delegation for the Third Law of Sea Conference) A/AC.138/SC.III/L.18, preamble, principle 3.

²⁴ Revised Guide (n 3).

²⁵ *ibid* 6.

Guidelines of the Commission on the Limits of the Continental Shelf in 1999.²⁶ These guidelines lay down the scientific methods for measuring the continental shelf. As the Commission explained in the introduction, the guidelines were aimed:

to clarify its interpretation of scientific, technical and legal terms contained in the Convention. Clarification is required in particular because the Convention makes use of scientific terms in a legal context which at times departs significantly from accepted scientific definitions and terminology. In other cases, clarification is required because various terms in the Convention might be left open to several possible and equally acceptable interpretations.²⁷

The guidelines describe several methods to determine the continental shelf and stress the need of interdisciplinary scientific and technical cooperation. For several methods the Commission suggests that certain information should be provided, for example for geodetic information: source of the data, positioning survey technique, time and date of the survey, corrections applied to the data, *a priori* or *a posteriori* estimates of random and systematic errors, geodetic reference system, and geometric definition of straight, archipelagic and closing lines.

The Intergovernmental Oceanographic Commission (IOC) was established in 1960 under UNESCO to promote international cooperation and to coordinate 'programmes in marine research, services, observation systems, hazard mitigation, and capacity development in order to understand and effectively manage the resources of the ocean and coastal areas.'²⁸ Its Advisory Body of Experts on the Law of the Sea (ABE-LOS) has been working on the practice of states regarding MSR, on defining guidelines for the transfer of marine technology, the procedure for MSR under the auspices of international organizations according to Article 247 and it has contributed to the MSR guide of UN Division for Ocean Affairs and the Law of the Sea.²⁹ The IOC Ocean Science Sections (OSS) is preparing the Global Ocean Science Report mapping present MSR and identifying gaps. It is planned to be presented in December 2016 and may include some description of MSR. At present, the IOC refers to the UNESCO Thesaurus for its terminology. The UNESCO Thesaurus defines marine science as

²⁶ CLCS Rules of Procedure and the Scientific and Technical Guidelines of the Commission on the Limits of the Continental Shelf, UN Doc. CLCS/11.

²⁷ *ibid*, [1.3].

²⁸ About the Intergovernmental Oceanographic Commission (IOC), <http://www.unesco.org/new/en/natural-sciences/ioc-oceans/about-us/>, accessed 6 June 2017.

²⁹ IOC, <http://ioc-unesco.org/>, accessed 6 June 2017. See also Revised Guide (n 3).

oceanography and ‘general scientific works.’³⁰ Oceanographic research is described as ‘works dealing with research projects.’³¹ Scientific research includes ‘applied research, fundamental research and interdisciplinary research.’³² Applied research covers ‘mission oriented research’ and ‘research and development’, and is described as ‘research which is designed to create a new technology’³³

One of IOC’s main activities is to coordinate the Global Ocean Observing System (GOOS). GOOS is ‘a system of programmes, each of which is working on different and complementary aspects of establishing an operational ocean observation capability for all of the world’s nations.’³⁴ According to the IOC-GOOS website, GOOS is made of many observation platforms:

- 3000 argo floats which collect high-quality temperature and salinity profiles from the upper 2000m of the ice-free global ocean and currents from intermediate depths
- 1250 drifting buoys which record the currents of surface, the temperature and the atmospheric pressure
- 350 embarked systems on commercial or cruising yachts which collect the temperature, salinity, the oxygen and the carbon dioxide (CO₂) in the ocean and the atmosphere, and the atmospheric pressure.
- 100 research vessels which measure all the physical, chemical and biological parameters, between the surface of the sea and the ocean floors every 30 nautical miles out of 25 transoceanic lines.
- 200 marigraphs and holographs which transmit information in quasi real time, thus providing the possibility of detecting tsunamis.
- 50 commercial ships which launch probes measuring the temperature and salinity between the surface and the ocean floor on their transoceanic ways.
- 200 moorings in open sea which are used as long-term observatories, recording weather, chemical and biological parameters on a fixed site between the surface and the bottom.³⁵

³⁰ UNESCO Thesaurus, <http://vocabularies.unesco.org/browser/thesaurus/en/page/concept12902>.

³¹ *ibid.*

³² UNESCO Thesaurus, <http://vocabularies.unesco.org/browser/thesaurus/en/page/concept111>.

³³ UNESCO Thesaurus, <http://vocabularies.unesco.org/browser/thesaurus/en/page/concept2563>.

³⁴ The Global Ocean Observing System, <http://www.goosocean.org/> (GOOS).

³⁵ *ibid.*

The IOC describes ocean observation as a way to acquire scientific knowledge which should benefit the wellbeing of humans and ecosystems alike. As ocean observation is part of the science of oceanography, we can assume that ocean observation is a specific kind of MSR which could provide data indispensable for further research.³⁶ But, as the GOOS demonstrates, not every ‘platform’ may be seen as research platform, e.g. the units on commercial ships. It may well be possible to carry out MSR from vessels or platforms that are not primarily operational for research purposes. However, it seems to be justifiable that the specific conduct which is performed because of participating in a MSR programme is a MSR operational activity.

UN General Assembly defines marine scientific research in relation to the deep sea as ‘to improve understanding and knowledge of the deep sea, including, in particular, the extent and vulnerability of deep sea biodiversity and ecosystems.’³⁷

Within the International Maritime Organization (IMO) there is a lot of attention for ocean fertilization as scientific research. In 2010 the IMO adopted the Assessment Framework for Scientific Research Involving Ocean Fertilization in order to assess whether proposals for ocean fertilization constitute legitimate scientific research.³⁸ The framework provides a tool for assessing proposed activities on a case-by-case basis to determine if the proposed activity constitutes legitimate scientific research that is not contrary to the aims of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Dumping Convention) or its Protocol.³⁹ Its goal is to distinguish ‘scientific projects’ from ‘other projects’.⁴⁰ To determine whether a proposal has proper scientific attributes, it should meet the following criteria:

1. The proposed activity should be designed to answer questions that will add to the body of scientific knowledge. Proposals should state their rationale, research goals, scientific hypotheses and methods, scale, timings and locations with clear justification for why the expected outcomes cannot reasonably be achieved by other methods;
2. Economic interests should not influence the design, conduct and/or outcomes of the proposed activity. There should not be any financial and/or economic gain arising directly from the experiment or its outcomes. This should not preclude payment for

³⁶ Differently, Roach and Smith claim that the United States do not view operational oceanographic as MSR; J Ashley Roach and Robert W Smith, *Excessive Maritime Claims* (3rd edn Brill 2012) 448.

³⁷ GA Resolution on Oceans and the law of the sea, UN Doc. A/RES/60/30, par. 85.

³⁸ Resolution LC-LP.2(2010) on the Assessment Framework for Scientific Research involving Ocean Fertilization, Adopted on 14 October 2010.

³⁹ *ibid.*

⁴⁰ *ibid.*, Annex 6, 4.

services rendered in support of the experiment or future financial impacts of patented technology;

3. The proposed activity should be subject to scientific peer review at appropriate stages in the assessment process. The outcome of the scientific peer review should be taken into consideration by the Contracting Parties. The peer review methodology should be stated and the outcomes of the peer review of successful proposals should be made publicly available together with the details of the project. Where appropriate, it would be beneficial to involve expert scientists from other countries; and

4. The proponents of the proposed activity should make a commitment to publish the results in peer reviewed scientific publications and include a plan in the proposal to make the data and outcomes publicly available in a specified time-frame.⁴¹

Next to this initial assessment the framework provides an extensive manual for assessing effects and risks. Of course, any project should also conform the provisions of the LOSC. The activity of ocean fertilization as MSR is the ultimate version of applied science: the activity that is researched is carried out at the same time. Special attention is required as the possible harmful effects of ocean fertilization to the marine environment are unknown and possible irreversible.

The International Seabed Authority (ISA) was set up by LOSC to organize and control activities in the Area. According to Article 165 LOSC its Legal and Technical Commission has the task to establish a monitoring programme according to scientific methods. Nandan, Secretary-General of ISA, stated during a workshop on collaboration in MSR in 2002:

Administering the Area requires knowledge of the Area. The only way one can learn about the Area is through scientific research and at the present time, mineral exploration. We have learnt something about the Area from contractors with the Authority. These contractors are engaged in exploration for polymetallic nodules and hope to start mining these mineral resources at the opportune time. They are not undertaking their activities in the broad pursuit of science. The contractors are working towards extracting mineral resources from the deep seabed. While there is a certain amount of science inherent in that effort, and under the Mining Code they are required to observe certain aspects of the oceans in relation to the activities that they undertake, theirs is not marine scientific research. In order to be able to manage mining the

⁴¹ *ibid*, 5.

resources of the Area in such a way as to prevent serious harm to the marine environment, however, the Authority has to have broader knowledge of the Area.⁴²

Again, scientific research is described as an activity to increase knowledge. A clear distinction is made between applied research, with a view of exploration, and fundamental science. According to Nandan applied research does not fall within the definition of MSR. This view seems not to be shared by most participants of the workshop who stress the importance of scientific collaboration.⁴³ Furthermore, the results of marine research activities carried out by contractors were described. Also the creation of a forum for MSR was discussed in which scientists and contractors could cooperate in integrated projects and share results of research.⁴⁴

The North Pacific Marine Science Organization (PICES), an intergovernmental organization, was set up in 1992 to promote and coordinate marine research in the northern North Pacific and adjacent seas. In its founding Convention For A North Pacific Marine Science Organization it is stated that PICES should promote and coordinate MSR 'in order to advance scientific knowledge of the area concerned and of its living resources, including but not necessarily limited to research with respect to the ocean environment and its interactions with land and atmosphere, its role in and response to global weather and climate change, its flora, fauna and ecosystems, its uses and resources, and impacts upon it from human activities.'⁴⁵ In its Strategic Plan of 2011 by defining the research themes for the coming five years, the advancement of scientific knowledge is described as follows:

- Understand the functioning, resilience, and vulnerability of marine ecosystems. PICES scientific activities are dedicated to understanding and quantifying the physical, chemical and biological processes of North Pacific ecosystems, which underlie ecosystem resilience and vulnerability. These processes are also key to understanding how the oceans respond to and are affected by climate change.
- Understand and quantify how marine ecosystems respond to human activities and natural forcing. Being a part of the ecosystem, humans are affected by natural

⁴² ISA, *Prospects for international collaboration in marine environmental research to enhance understanding of the deep-sea environment: proceedings* (ISA 2002), 7.

⁴³ *ibid* 11.

⁴⁴ *ibid* 31.

⁴⁵ Convention For a North Pacific Marine Science Organization (adopted 12 December 1990, entered into force 24 March 1992) Can TS 8 (1992).

processes, and in turn impact marine ecosystems. This goal addresses ecosystem effects of climate variability and change, catastrophic events, and anthropogenic stressors in coastal and offshore regions.⁴⁶

PICES has also numerous publications available including guides on best practices with detailed instructions for certain research fields.⁴⁷

Overview of literature

As no definition is given in LOSC several authors have tried to define MSR or at least have explored different aspects of MSR. Of course, they seek connection to the definitions explored above, but also come with their own observations and thoughts. Soons, when commenting the just adopted LOSC, stipulates the underlying research question when defining scientific research, which is ‘commonly being regarded as an investigation of a question, problem, or phenomenon conducted according to the rules and principles of science, marine scientific research may be regarded as such investigation concerned with the (natural phenomena of the) marine environment.’⁴⁸ Also Verlaan lists the ‘answering of questions that will add to the body of scientific knowledge’ as a proper scientific attribute that should be included in the criteria to define MSR. In the most general term MSR is used ‘to describe those activities undertaken in the ocean a coastal waters to expand scientific knowledge of the marine environment and its processes.’⁴⁹ Wegelein refers to the definition of the OECD as ‘research comprises of creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society.’⁵⁰ He also points out that for defining MSR within the meaning of LOSC only the *in situ* experiments are taken into account, as only oceanographic activities may interfere with foreign interests.⁵¹ He also observes that vast areas of the ocean are still *terra incognita*, and should be open for scientific studies to improve knowledge.⁵² Wegelein refers to the study of Caflisch and Piccard of 1978, during the negotiations of LOSC,

⁴⁶ PICES Strategic Plan, approved at the 2011 PICES Annual Meeting on October 22, 2011, in Khabarovsk Russia (Decision 2011/A/4).

⁴⁷ See for example AG Dickson, CL Sabine and JR Christian (eds.), *Guide to best practices for ocean CO2 measurements* (PICES 2007).

⁴⁸ Alfred HA Soons, *Marine Scientific Research and the Law of the Sea* (TMC Asser 1982) 124.

⁴⁹ Roach and Smith (n 36) 415.

⁵⁰ Wegelein (n 6) 11 citing Organisation for Economic Co-operation & Development, *Frascati Manual: 1993, The measurement of scientific and technological activities; proposed standard practice for surveys of research and experimental development*, (OECD Paris 1994) 13.

⁵¹ Wegelein (n 6) 12.

⁵² Wegelein (n 6) 19.

who were suggesting a distinction on the basis of intention for MSR or scientific research.⁵³ Caflisch and Piccard propose open publication as ascertaining the intention of the activity: '[T]he intentions of an institution or of individuals claiming to conduct MSR can be ascertained by examining whether the open publication of the results of the project is intended or not. Neither exploration or exploitation activities nor resource-related or military research will meet the condition for open publication, for the results of such activities or research will necessarily remain secret; there is no reason, on the other hand, to refuse to publish the results of fundamental research.'⁵⁴ This issue is also addressed by Harden Davies distinguishing pure and applied research, which also related to the openness of the information acquired, in the form of dissemination of data, exchange of samples and the publication of research results.⁵⁵ But she also admits that there is an 'overlapping nature of "pure" and "applied" research.'⁵⁶

Also how research is carried out could provide guidance for defining MSR: '[m]arine scientific research is that part of science that applies scientific methods to explain and understand the marine environment.'⁵⁷ Wegelein suggests that 'to fall under the regime of marine scientific research, sampling of any kind must be carried out with a view to scientific analysis, i.e., it must relate to some question, problem or phenomenon of the marine world, which is investigated by scientific methods. Mere private sampling for collecting purposes is not a scientific discipline and therefore does not fall in the scope of the present analysis either.'⁵⁸

Many authors stipulate the interdisciplinary character of MSR.⁵⁹ Wegelein lists scientific disciplines such as biology, chemistry, physics, geology, meteorology, hydrography, and oceanography, and in his view it makes no sense to distinguish between the various disciplines. Oceanography he describes as 'the holistic study of the marine environment, namely, the system of oceans and atmosphere from all possible views of the marine sciences.'⁶⁰ He concludes that '[a]n important element of oceanography in the holistic sense is the size of

⁵³ Wegelein (n 6) 82-83.

⁵⁴ Lucius Caflisch and Jacques Piccard, 'The Legal Regime of Marine Scientific Research and the Third United Nations Conference on the Law of the Sea,' *Zeitschrift Für Ausländisches Öffentliches Recht Und Völkerrecht: ZaöRV* 38, no. 3 (1978): 848-901.

⁵⁵ Harriet Harden Davies, 'The regulation of Marine Scientific Research, Addressing Challenges, Advancing Knowledge' in RM Warner and SB Kaye (eds.), *Routledge Handbook of Maritime Regulation and Enforcement* (Routledge 2016) 212-230, 213.

⁵⁶ Harden Davies (n 55) 213.

⁵⁷ Wegelein (n 6) 81.

⁵⁸ *ibid* 82.

⁵⁹ Warren S Wooster, 'On the evolution of international marine science institutions,' *Ocean Yearbook* 10, 1993, 172-181, 172.

⁶⁰ Wegelein (n 6) 16.

its programmes and tasks. Oceanography is inherently international and requires a combination of various instruments over wide spatial extension and long periods of time.’⁶¹

Harden Davies lists as mode of MSR observation, surveying and sampling, among other forms.⁶² She refers to floats and drifting buoys as technologies that have grown significantly since the adoption of LOSC and points to the unclear legal status of these instruments, even questioning whether their use falls within the LOSC regime for MSR.⁶³ She addresses the distinction between research and operational oceanography. Research oceanography is based on a certain premise or hypothesis that have to be verified through the experiment,⁶⁴ while operational oceanography includes the collection of data that can be used for various studies, and involves continuous and long term observation and monitoring. Operational oceanography allows countries to monitor, understand and predict weather and climate, to describe and forecast the state of the ocean, including living resources, to improve management of marine and coastal ecosystems and resources, to mitigate damage from natural hazards and pollution, to protect life and property on coast and at sea, and to enable further scientific research.⁶⁵ Indeed, according to the OIC/ABE-LOS the Argo Programme is a major contribution to several scientific research programmes,⁶⁶ and Harden Davies concludes that those programmes that are consistent with the principles of MSR, such as peaceful purposes, would indeed qualify as such.⁶⁷ A further ambiguity is addressed by Wegelein referring to Article 21(1)(g) LOSC dealing with MSR and hydrographic survey – the activity measuring, describing and depicting the seabed for navigation and exploration purposes – which he sees apart from MSR, though pointing that states may have a different view. He also discusses the distinction made in Article 246 LOSC between MSR ‘exclusively for peaceful purposes and in order to increase scientific knowledge of the marine environment for the benefit of all mankind and MSR that ‘is of direct significance for the exploration and exploitation of natural resources, whether living or non-living.’⁶⁸ According to Article 246 LOSC coastal states may withhold their consent in the latter case. Also Staniland observed in 1983 that the International Law Commission in relation to the Continental Shelf Convention made a distinction between research on the conservation of

⁶¹ Wegelein (n 6) 17.

⁶² Harden Davies (n 55) 213.

⁶³ Harden Davies (n 55) 222.

⁶⁴ Wegelein (n 6) 20.

⁶⁵ Roach and Smith (n 36) 448.

⁶⁶ 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 Programme, IOC Executive Council Res EC-XLI.4, IOC 41st Session of the Executive Council, IOC/EC-XLI/3. Paris, 29 July 2008.

⁶⁷ Harden Davies (n 55) 223.

⁶⁸ Wegelein (n 6) 83-84.

living resources and research relating to the exploration and exploitation of the seabed or subsoil,⁶⁹ a distinction that coincides with that between fundamental and applied MSR. Whether this distinction is also relevant for MSR on the high seas is doubtful, as no consent of other states is required.

Harden Davies points out some controversies regarding MSR: manipulation of the marine environment (e.g. geoengineering), sharing of benefits (e.g. marine genetic resources), and the protection of jurisdictional rights (e.g. ocean observing systems). She also addresses that a lack of defining and regulating MSR could create uncertainty, in particular ‘where research involves new technologies, novel actors, marine resources or measures that entail lethal harm to marine life or manipulation of the marine environment.’⁷⁰

Conclusions

Although MSR is not defined in LOSC, the treaty does give some guidance. First, according to Article 240, MSR should be carried out exclusively for peaceful purposes. The IOC has also pointed out the MSR should benefit the wellbeing of humans and ecosystems alike. This requirement has been interpreted that activities should not have a direct commercial purpose. So generally, exploration and exploitation activities will not fall within the MSR definition. But both in the practice of international organisation as well as in the literature, there is no distinction between fundamental research and applied research. Often cooperation is sought between commercial ships and contractors.

Second, MSR should contribute to knowledge of the marine environment. In the literature several disciplines are discerned, such as biology, physics and meteorology, but there is a common understanding that all types of marine sciences will be recognised as MSR as long as it contribute to knowledge of the marine environment. In a sense the broad scope of ‘oceanography’ could be seen a synonym of MSR.

Third, MSR is an activity that is carried out according a scientific method. Several documents stress that such a method should include a hypotheses and research objectives or should relate to a certain question, problem or phenomenon, validating the research.⁷¹ However, the taking of samples and collecting of data without a particular research objective, such as observation projects, in particular ICO-GOOS, is also commonly accepted as MSR,

⁶⁹ Hilton Staniland ‘Some aspects of the international legal regime of marine scientific research concerning the continental shelf’, (1983) 16 *Comp. & Int’l L.J. S. Afr.* 229-230.

⁷⁰ Harden Davies (n 55) 220.

⁷¹ Resolution LC-LP.2(2010) on the Assessment Framework for Scientific Research involving Ocean Fertilization, Adopted on 14 October 2010; *Whaling case* (n 15); Revised Guide (n 3).

as it might provide data for further research in the future. An important aspect is that research objectives as well as the research results should be published.

Fourth, the definition of MSR only applies to *in situ* activities. Only research that is actually carried out at sea can be qualified as MSR and grants the rights and obligations of MSR under LOSC. Therefore only the *in situ* activities should comply with the above described elements of MSR.

Rights and obligations under MSR

What are the duties when a project can be labelled as MSR, and which rights could be obtained through this label? And which rights are attached to MSR? Addressees of obligations and rights are states and international organisations,⁷² as is confirmed by the terms in Part XIII of LOSC. Article 263 regulates responsibility and liability, stipulating that states are responsible for ensuring that MSR is carried out in accordance with LOSC. Also in Article 248, it is the states that have to provide certain information to coastal states when seeking consent for MSR in the EEZ, not the research project itself. At the rights spectrum, the right to pursue MSR in Article 238 is only granted to states. This is in line with Article 87 which includes the freedoms of the high seas, MSR being one of them. Throughout Part XIII rights and obligations for both researching states and coastal states can be discerned. These will now be discussed from the perspective of the state conducting MSR.

Obligations

Looking at the obligations related to MSR, three categories can be discerned: (1) compliance with the freedoms of the high seas of Article 87 and the principles of MSR in Article 240, (2) publication and dissemination obligations in Article 244 and (3) compliance with Part XII of LOSC, the chapter on the protection and preservation of the environment.

General principles

The general principles for the conduct of MSR are included in Article 240. First of all, MSR should be carried out exclusively for peaceful purposes. This means that any research that is related to defence or intelligence activities falls outside the scope of MSR. Practically, it may also imply that MSR, in general, cannot be carried out by naval ships. Second, MSR should be

⁷² In this memo we often only refer to states, but most rights and obligations in Part XIII also apply to 'competent international organizations'. An exception is Article 247 which addresses MSR undertaken by international organisations in particular.

conducted with appropriated scientific methods and means. As discussed above, this would require a research question or hypothesis, although observation and data collection is also qualified as MSR. As with the definition of scientific research, there is no exact definition of scientific methods, although in some occasions certain methods are advised.⁷³ In relation to ocean fertilization the IMO formulated an assessment framework with criteria for proposals for scientific projects, requiring a description of ‘a rationale, research goals, scientific hypotheses, scale, timings and locations with clear justification for why the expected outcomes cannot reasonably achieved by other methods.’⁷⁴ Besides, there is ample practice of MSR on the high seas which can serve as guidance for The Ocean Cleanup. Third, there is the obligation not to unjustifiably interfere with other legitimate uses of the sea. Article 87 states the freedoms of the high seas and presents a non-exhausted list with activities. Most evident uses at the high seas are navigation and fisheries, but also submarine cable operations and other MSR activities should be considered. Furthermore, activities in the Area should not be overlooked when planning MSR. Article 87 also stipulates that activities should be carried out with due regard for the interests of other states, which has already been addressed in the Study. Fourth, MSR should be carried out in compliance with all relevant regulations. This is also stipulated in Article 87 stating that the freedoms of high seas should be exercised in conformity with LOSC and other rules of international law. As previously addressed by the Study, this entails, first of all, compliance with the International Regulations for Preventing Collisions at Sea (COLREGs), the International Convention for the Prevention of Pollution from Ships (MARPOL), and the International Convention for the Safety of Life at Sea (SOLAS).⁷⁵ Further guidance can be found in other IMO Conventions and IMO Guidelines on more specific subjects.

Publication

The second category of obligations for MSR activities is included in Article 244 on publication and dissemination. This article requires states to make available information on proposed major programmes and their objectives as well as knowledge resulting from MSR. Generally, some

⁷³ See for example the CLCS Rules of Procedure and the Scientific and Technical Guidelines of the Commission on the Limits of the Continental Shelf, UN Doc. CLCS/11.

⁷⁴ Resolution LC-LP.2(2010) on the Assessment Framework for Scientific Research involving Ocean Fertilization, Adopted on 14 October 2010, 5.

⁷⁵ International Regulations for Preventing Collisions at Sea (adopted 20 October 1972, entered into force 15 July 1977) 1050 UNTS 16 (COLREGs); International Convention for the Prevention of Pollution from Ships (adopted 2 November 1973, entered into force 2 October 1983) 1340 UNTS 184 (MARPOL); International Convention for the Safety of Life at Sea (adopted 1 November 1974, entered into force 25 May 1980 (SOLAS).

publication and dissemination of information is required, either by sharing data and information and making it accessible, for example through the internet,⁷⁶ or by publishing the results of the MSR project. A more specific approach is required in the assessment framework regarding ocean fertilisation of the IOM which stipulates peer review and publicly available peer review outcomes of the scientific proposal. Furthermore, a commitment to publish results within a specified time-frame should be part of the proposal. The publication and dissemination condition is also relevant for the distinction between fundamental science and applied science. Fundamental science implies full publication of data and results, while applied science could lead to a certain selection of results.⁷⁷

Environmental obligations

The third category of obligations for MSR refers to conformity with the protection and preservation of the environment, in particular Part XII of LOSC. These obligations apply to all ocean uses, as also confirmed by the Study. First, the general obligation not to harm the environment is pointed out by the Study. Articles 192 and 194 requires states to protect and preserve the marine environment and to take measures to prevent, reduce and control pollution from activities under their jurisdiction. This is further elaborated on in the Study.

Second, the obligation to carry out an Environmental Impact Assessment (EIA) is indicated. Article 206 provides the obligation to carry out an assessment of the potential effects of an activity on the marine environment. The assessment should be carried out '[w]hen states have reasonable grounds for believing that planned activities under their jurisdiction or control may cause substantial pollution of or significant and harmful changes to the marine environment.'⁷⁸

The Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) includes a list of activities in Appendix I providing guidance which kind of activities are likely to cause significant adverse effects.⁷⁹ The list includes major offshore oil and gas installation and major wind farms, but it is not exhaustive. If The Ocean Cleanup activity would have been consisted of a 100 km array attached to the sea bed, the dimension of the installation might have triggered the applicability of the provision, even if no significant adverse effects were expected. However, with the new design of the multiple smaller arrays it could be questioned whether an assessment is really mandatory under LOSC. Fishing, even

⁷⁶ See for example GOOS, <http://www.goocean.org/>

⁷⁷ Wegelein (n 6) 71.

⁷⁸ Article 206 LOSC.

⁷⁹ Convention on Environmental Impact Assessment in a Transboundary Context (adopted 25 February 1991, entered into force 10 September 1997) 1989 UNTS 000 (Espoo Convention), Appendix I as amended in 2004.

large scale fishing, is generally not seen as an activity requiring an EIA – but regulated by regional and national fishery agreements and policies – though a large fishing farm in coastal waters would probably require an EIA in many countries. Also the long-term operation of The Ocean Cleanup array would point to a more permanent activity, and therefore involve an EIA. According to the IMO Assessment Framework for Scientific Research Involving Ocean Fertilization, a MSR proposal for ocean fertilization requires an environmental assessment providing detailed information on location, size, discharge of substance (amount, composition), effects on ecosystem, methods, etc.⁸⁰ Although the document itself does not refer to any legal requirement concerning an EIA, an assessment designed according these guidelines would be conform international standards on EIA in our view.

Rights

According to Article 87 and more particular to Article 257 all states – and certain competent international organisations – have the right to pursue MSR in the water column of the high seas. This right is addressed to states, not to individuals or private organisations. A project such as The Ocean Cleanup can therefore only be labelled as MSR if a state would be willing to do so. Projects labelled as MSR would via the researching state benefit from certain rights and entitlements. We have distinguished three categories of rights: (1) the right of being facilitated by other states; (2) protection of MSR; and (3) any dispute concerning MSR activities can be addressed on a state-to-state level.

Facilitation

In Article 255 states are being called upon to facilitate access to their harbours and to promote assistance for marine scientific research vessels. The article also seeks the adoption of ‘reasonable rules, regulation and procedures to promote and facilitate marine scientific research.’⁸¹ Wegelein points out that research vessels may want ‘to replenish bunkers, disembark or take on board crew and other persons or material.’⁸² However, he also stipulates that port access is not a right in itself: it may only mean that it ‘prevents at least the introduction of less favourable treatment on the basis of the characteristic “research”.’⁸³

Diplomatic Protection

⁸⁰ Resolution LC-LP.2(2010) on the Assessment Framework for Scientific Research involving Ocean Fertilization, Adopted on 14 October 2010.

⁸¹ Article 255 LOSC.

⁸² Wegelein (n 6) 327.

⁸³ *ibid*, 334.

Since MSR is carried out under authority of a state, that state may stand up for its freedoms and rights of MSR *vis-à-vis* other states. It may do so by following the normal diplomatic channels, and also by using the dispute settlement mechanism of LOSC.

Disputes

Article 264 confirms that the dispute mechanism of LOSC under Part XV is available for disputes concerning the interpretation and application of Part XIII regarding MSR. Sections 2 and 3 are applicable offering a choice between the International Tribunal for the Law of the Sea, the International Court of Justice and arbitration.

Responsibility and liability in relation to MSR

Article 263 provides specific rules for responsibility and liability for MSR both for states conducting research and for states damaging MSR of other states. First, the researching state is responsible for ensuring that the research project is carried out in accordance with LOSC. According to Wegelein, this article entails a broader level of responsibility than Article 94 which regulates the duties and responsibilities of flag states over their ships. Article 263 seems to suggest that when MSR is conducted in contravention of LOSC, the researching state is automatically responsible. Also, for any damage to the marine environment caused by MSR the researching state is responsible and liable, and the rules of Part XII would apply. Second, coastal states are responsible and liable for damage to MSR. Wegelein gives the example of denial of consent contrary to the LOSC, and other duties coastal states have with regard to MSR. This is a clear sign that researching states may actually claim their entitlement under Part XIII and if not granted, may suffer damage for not being able to carry out MSR under LOSC. Article 263 is without prejudice to all other international and national rules concerning responsibility and liability, such as the Articles on State Responsibility, COLREGS and SOLAS.

PART II

The Ocean Cleanup activities as Marine Scientific Research

Applying the definition of MSR to The Ocean Cleanup activities

Recapturing the conclusions of Part I, MSR is characterized by four major elements: peaceful and not for a direct commercial purpose, contribution to the knowledge of the marine environment, usage of a scientific method, and only applicable on *in situ* activities.

To start with the last, the status of MSR will only apply to activities at sea. So, strictly speaking, only the operations of The Ocean Cleanup have to meet the requirements. Nevertheless, the activities are normally closely associated with the organisation carrying out the activities. Continuing with the other elements, first, there is no doubt that the activities are carried out for peaceful purposes. The Ocean Cleanup was founded in 2013 with the purpose of cleaning up the oceans. The activities of The Ocean Cleanup at this moment focus on designing a cleanup system to remove plastic from the ocean. The mission of The Ocean Cleanup is ‘to develop advanced technologies to rid the world’s oceans of plastic’, thereby realising a cleaner ocean and an improvement of its ecosystem. Furthermore, no commercial plans are deployed. The Ocean Cleanup is a foundation under Dutch law and the form of foundation does not allow any payments to the founders or contributors and donors. It may only make payments for an idealistic or social purpose. But even when certain activities were leading to some kind of exploitation, the test phase as well as any other activity that would contribute to increasing knowledge could fall within the definition of applied science. In the unlikely circumstance of operating from a naval ship, The Ocean Cleanup activities carried out from and on this ship may not benefit from the MSR status.

The activities of The Ocean Cleanup are a clear contribution to the knowledge of the marine environment, more specific to the methods of cleaning up plastics at sea. A comparison can be made with oil spills removal and the development of techniques to handle oil spills in the best way.⁸⁴ The Ocean Cleanup organisation consists of multiple scientists working in a variety of sciences, covering oceanography, hydrodynamics and biology. They carry out research that is published in peer-reviewed journals.

Another element to discuss is method of research. The activity should be carried out according a scientific method. The Ocean Cleanup Feasibility Study of 2014 contains the

⁸⁴ See for example the US research activities regarding oil spills: EPA, *Oil Spills Research*, <https://www.epa.gov/land-research/oil-spills-research>, accessed 14 July 2017.

results of research done before 2014 and also includes an outlook to further tests.⁸⁵ It shortly refers to certain methods of research, such as oceanography and engineering. It could be useful to explicitly formulate the research methods and objectives when applying for an MSR status.

Additional obligations for The Ocean Cleanup activities with an MSR status

Further obligations regarding MSR stated in Article 240 include the obligation not to unjustifiably interfere with other uses and the compliance with all relevant regulations. These requirements are applicable to any activity at the high seas irrespective whether it has the MSR status or not. Since this has already been discussed by the Study we will not further elaborate on it in this memo. In Part I we addressed the obligation to publish and disseminate in Article 244. We recommend The Ocean Cleanup to keep in mind this obligation when planning The Ocean Activities. Although the IOM presses for peer review with regard ocean fertilisation, we imagine this is related with the controversial character of ocean fertilisation itself. Since open source publication and publication on own websites is increasing in popularity and acceptance,⁸⁶ we feel this requirement can quite easily be met by The Ocean Cleanup.

With regard to environmental protection, the MSR status of The Ocean Cleanup activities will not put additional burdens to the project, as these rules are also applicable to other uses of the high seas. With regard to carrying out an EIA – if the MSR status would label the activities as Dutch –, case law suggests that first and foremost Dutch regulation would be applicable.⁸⁷ Further guidance can be found in international documents, such as UNEP documents and the IMO Assessment Framework for Scientific Research Involving Ocean Fertilization.⁸⁸

Benefits of the MSR status for The Ocean Cleanup

In Part I we identified three rights of states in relation to MSR. Although states are the addressees of these rights, The Ocean Cleanup activities may benefit from a MSR status.

⁸⁵ Boyan Slat, *How the oceans can clean themselves: a feasibility study (2014 The Ocean Cleanup) (Feasibility Study)*.

⁸⁶ See for example the results of the European contribution to the Argo programme, at Euro-Argo, Euro-Argo ERIC activity report 2014, <http://www.euro-argo.eu/Main-Achievements/Activity-Reports/EA-ERIC-activity-report-2014>, accessed 14 July 2017; and Argo Program, Argo Data Management, <http://www.argodatamgt.org/>, accessed 14 July 2017.

⁸⁷ ICJ, *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, Judgment, [205].

⁸⁸ UNEP, *Environmental Impact Assessment and Strategic Environmental Assessment: Towards an Integrated Approach* (UNEP 2004); Resolution LC-LP.2(2010) on the Assessment Framework for Scientific Research involving Ocean Fertilization, Adopted on 14 October 2010.

First, MSR activities should be facilitated by coastal states by providing port access. Also, other states should promote assistance to MSR activities. As the cleanup activities will take place at the Northern Pacific Ocean, an area being monitored by the US and also most close by to the US, LOSC would suggest that the US should at least not hinder The Ocean Cleanup activities. However, the US is not a member of LOSC, but it is a member state of the 1958 Convention on the High Seas and Convention on the Continental Shelf.⁸⁹ The former does not regulate MSR on the high seas, but the latter includes a provision on MSR at the continental shelf. Article 5 provides that a coastal state should not withhold its consent for ‘purely scientific research into the physical or biological characteristics of the continental shelf.’ At the US website concerning authorisation for MSR, the US refers nevertheless to LOSC as the legal basis for appointing the Office of Ocean and Polar Affairs (OPA) as ‘appropriate official channel.’⁹⁰ Apparently, the US follows the procedures of Part XIII for requesting and providing consent for MSR. And, while referring to the fact that LOSC does not define MSR, the US provides its own quite limited definition of MSR.⁹¹ According to the US the definition does not include ‘environmental monitoring and assessment of marine pollution’, ‘the collection of marine meteorological data’, including the JCOMM programme, the Global Drifter Program, and the Argo programme. Although this definition departs from our findings on defining MSR in Part I and does not reflect the consensual definition of MSR, the US position could be taken into account when describing the research objectives for The Ocean Cleanup activities.

Second, if The Ocean Cleanup activities are endorsed as MSR by the Netherlands, the Dutch government may act as the negotiation partner in relations with other states and international organisations such as the IMO. The Netherlands, as ‘owner’ of its MSR, could represent the interests of The Ocean Cleanup, but may also claim its rights *vis-à-vis* other states.

⁸⁹ Convention on the Continental Shelf (adopted 29 April 1958, entered into force 10 June 1964) 499 UNTS 311.

⁹⁰ U.S. Department of State, *Marine Scientific Research Authorizations*, <https://www.state.gov/e/oes/ocns/opa/rvc/>, accessed 14 July 2017.

⁹¹ *ibid.* ‘While the Law of the Sea Convention does not define marine scientific research (MSR), the term generally refers to those activities undertaken in the ocean to expand knowledge of the marine environment and its processes. The United States has identified some marine data collection activities that are not marine scientific research. These include prospecting for and exploration of natural resources; hydrographic surveys (for enhancing the safety of navigation); military activities including military surveys; activities related to the laying and operation of submarine cables; environmental monitoring and assessment of marine pollution pursuant to section 4 of Part XII of the Convention; the collection of marine meteorological data and other routine ocean observations - such as those used for monitoring and forecasting of ocean state, natural hazard warnings and weather forecasts, and climate prediction - including through the voluntary ocean observation programs of the Joint Intergovernmental Oceanographic Commission-World Meteorological Organization Technical Commission on Oceanography and Marine Meteorology (JCOMM), the Global Drifter Program, and the Argo program; and activities directed at objects of an archeological and historical nature found at sea.’

One of the issues for The Ocean Cleanup could be access to US ports for its research ships, even if they are not flying the Dutch flag.

And third, as we have seen with regard the Arctic Sunrise of Greenpeace, the flag state, and, in case of MSR, the researching state may institute proceedings against another state, when its rights under LOSC have been violated. The Netherlands was willing to bring the case before ITLOS and the Permanent Court of Arbitration after diplomatic negotiations failed.⁹² Although this right, as well as those described above, are within the discretion of the researching state, if the researching state is committed and willing, it has clear benefits for those whose ‘rights’ are being protected.

Examples of the Dutch MSR practice

It was difficult to find Dutch projects that have been recognised by the Dutch government as MSR. Information about research projects is often published on the internet, but their legal status is not mentioned. We identified several organisations carrying out research at the high seas, such as the Netherlands Institute for Sea Research (NIOZ), the Maritime Research Institute Netherlands (MARIN), Wageningen Marine Research, Centre for Maritime Research (MARE), and companies such as Royal HaskoningDHV and Boskalis. For part of their projects it seems likely that it is carried out as Dutch MSR, but it also appears that a lot of research is done in cooperation with international partners.

One example is the global Argo project, launched by the IOC and the World Meteorological Organization (WMO) in 2000. Its main objective is to ‘provide a quantitative description of the changing state of the upper ocean and the patterns of ocean climate variability from months to decades, including heat and freshwater storage and transport.’⁹³ It is part of the Global Ocean Observing System (GOOS) which serves as a framework and platform for ocean observing. The Argo project consists of 3,800 free-drifting profiling floats measuring temperature and salinity of the upper 2000 m of the ocean.⁹⁴ The European contribution to Argo is coordinated by France, via the Euro-Argo European Research Infrastructure Consortium (Euro-Argo ERIC). The Dutch participation is represented by the Royal Netherlands Meteorological Institute (KNMI).⁹⁵ Interestingly, each float can be traced down

⁹² ITLOS, *The Arctic Sunrise Case (Kingdom of the Netherlands v. Russian Federation)*, Provisional Measures, Order of 22 November 2013; PCA, *The Arctic Sunrise Arbitration (Netherlands v. Russia)*, Decision.

⁹³ ‘About Argo’ <http://www.argo.ucsd.edu/About_Argo.html> accessed 14 July 2017.

⁹⁴ ‘What is Argo?’ <<http://www.argo.ucsd.edu/>> accessed 14 July 2017.

⁹⁵ KNMI, ‘The Dutch Argo Project’ <<http://projects.knmi.nl/argo/>> accessed 14 July 2017.

to a national research programme and has a ‘nationality’. Also the European Union (EU) has deployed several argo floats under its own EU ‘flag’, as well as the UN. There are even platforms that have a dual nationality. This information is available on the JCOMMOPS website, which is part of GOOS, and includes data on all platforms and ships carrying out research activities under GOOS.⁹⁶

For this memo we have identified all ships and platforms that have the Dutch nationality. The JCOMMOPS database provides information on status, model, nationality, programme, deployment date, deployment location, and last location. We have registered relevant information in Table 1. Table 2 provides contact details for the program managers that were identified. In Table 3 we have listed the research ships that are sailing under the Dutch flag.

⁹⁶ JCOMMOPS <<http://www.jcommops.org>> accessed 14 July 2017.

Table 1 List of operational platform of the Netherlands

REFERENCE	TYPE	MODEL	DEPLOYMENT DATE	COUNTRY	DEPLOYMENT COUNTRY	MASTER PROGRAM	PROGRAM	PROGRAM MANAGER	DEPLOYMENT SHIP	SHIP TYPE
6901977	Float	APEX	22 October 2013	Netherlands		Argo	Argo NETHERLANDS	Andreas Sterl	PLANCIUS	Passenger ferries
6901972	Float	APEX	30 November 2013	Netherlands		Argo	Argo NETHERLANDS	Andreas Sterl	PLANCIUS	Passenger ferries
6901975	Float	APEX	06 December 2013	Netherlands		Argo	Argo NETHERLANDS	Andreas Sterl	PLANCIUS	Passenger ferries
6901976	Float	APEX	22 January 2014	Netherlands		Argo	Argo NETHERLANDS	Andreas Sterl	PLANCIUS	Passenger ferries
6901973	Float	APEX	09 April 2014	Netherlands		Argo	Argo NETHERLANDS	Andreas Sterl	PLANCIUS	Passenger ferries
6901978	Float	APEX	22 October 2014	Netherlands		Argo	Argo NETHERLANDS	Andreas Sterl	PLANCIUS	Passenger ferries
6901979	Float	APEX	27 October 2014	Netherlands		Argo	Argo NETHERLANDS	Andreas Sterl	PLANCIUS	Passenger ferries
6901982	Float	APEX	11 December 2014	Netherlands		Argo	Argo NETHERLANDS	Andreas Sterl	PLANCIUS	Passenger ferries
6901974	Float	APEX	12 December 2014	Netherlands		Argo	Argo NETHERLANDS	Andreas Sterl	POLARSTERN	Research Vessels
6901983	Float	APEX	17 December 2014	Netherlands		Argo	Argo NETHERLANDS	Andreas Sterl	PLANCIUS	Passenger ferries
6901980	Float	APEX	07 April 2015	Netherlands		Argo	Argo NETHERLANDS	Andreas Sterl	PLANCIUS	Passenger ferries
6901981	Float	APEX	15 April 2015	Netherlands		Argo	Argo NETHERLANDS	Andreas Sterl	PLANCIUS	Passenger ferries
NL-VOS-PCBZ-01012000	VOS Manual Weather Station	30 - VOSclim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	HAPPY ROVER	General Cargo
NL-VOS-PCGM-01012000	VOS Manual Weather Station	30 - VOSclim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	SINGELGRACHT	General Cargo
NL-VOS-PCGQ-01012000	VOS Manual Weather Station	30 - VOSclim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	ANJELIERSGRACHT	General Cargo
NL-VOS-PCIH-01012000	VOS Manual Weather Station	30 - VOSclim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	ROYAL KLIPPER	General Cargo
NL-VOS-PDGS-01012000	VOS Manual Weather Station	30 - VOSclim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	ROTTERDAM	Passenger Ships
NL-VOS-PDHO-01012000	VOS Manual Weather Station	30 - VOSclim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	MAERSK KIMI	Container ships
NL-VOS-PDHP-01012000	VOS Manual Weather Station	30 - VOSclim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	MAERSK KALMAR	Container ships
NL-VOS-PDHW-01012000	VOS Manual Weather Station	30 - VOSclim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	MAERSK PALERMO	Container ships

REFERENCE	TYPE	MODEL	DEPLOYMENT DATE	COUNTRY	DEPLOYMENT COUNTRY	MASTER PROGRAM	PROGRAM	PROGRAM MANAGER	DEPLOYMENT SHIP	SHIP TYPE
NL-VOS-PDHY-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	MAERSK PEMBROKE	Container ships
NL-VOS-PDKK-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	COOL EXPRESO	Refrigerated cargo ships
NL-VOS-PDUJ-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	QAMUTIK	General Cargo
NL-VOS-PDVN-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	EENDRACHT	Sailing Vessels
NL-VOS-PDWT-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	EGELANTIER SGRACHT	General Cargo
NL-VOS-PDWZ-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	EDAMGRACHT	General Cargo
NL-VOS-PDXQ-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	EEMSGRACHT	General Cargo
NL-VOS-PDYI-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	ELANDSGRACHT	General Cargo
NL-VOS-PDYV-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	ERASMUSGRACHT	General Cargo
NL-VOS-PDYX-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	MITIQ	General Cargo
NL-VOS-PDZS-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	EUROPA	Sailing Vessels
NL-VOS-PECA-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	STAD AMSTERDAM	Sailing Vessels
NL-VOS-PECF-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	IVER EXPERIENCE	Liquid Tankers
NL-VOS-PFBE-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	SLUISGRACHT	General Cargo
NL-VOS-PFBF-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	IVER EXPORTER	Liquid Tankers
NL-VOS-PFDH-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	MAERSK KAMPALA	Container ships
NL-VOS-9HA3564-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	ESMERALDA	General Cargo
NL-VOS-A8IP2-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	ELVIRA	Refrigerated cargo ships
NL-VOS-9HA3770-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	EMERALD	General Cargo
NL-VOS-TBWAA17-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	CORAL PAVONA	Gas Tankers
NL-VOS-OWAY2-01012000	VOS Manual Weather Station	10 - Selected	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	LICA MAERSK	Container ships

REFERENCE	TYPE	MODEL	DEPLOYMENT DATE	COUNTRY	DEPLOYMENT COUNTRY	MASTER PROGRAM	PROGRAM	PROGRAM MANAGER	DEPLOYMENT SHIP	SHIP TYPE
NL-VOS-OWFD2-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	JOHANNES MAERSK	Container ships
NL-VOS-PBBB-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	SPIUGRACHT	General Cargo
NL-VOS-PGRQ-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	PELAGIA	Research Vessels
NL-VOS-PHAA-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	TRAMPER	General Cargo
NL-VOS-PHAC-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	TRACER	General Cargo
NL-VOS-PHAQ-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	STATENGRACHT	General Cargo
NL-VOS-PHDL-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	SAMPOGRACHT	General Cargo
NL-VOS-PHHD-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	ARNEBORG	General Cargo
NL-VOS-PIAG-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	ORANJEBORG	General Cargo
NL-VOS-VRGW3-09092008	VOS Manual Weather Station	30 - VOSClim	09 September 2008	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	MAERSK STOCKHOLM	Container ships
NL-VOS-OXHY2-01112008	VOS Manual Weather Station	30 - VOSClim	01 November 2008	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	ELLY MAERSK	Container ships
NL-VOS-OZDQ2-01112008	VOS Manual Weather Station	30 - VOSClim	01 November 2008	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	MAERSK SAVANNAH	Container ships
NL-VOS-9V2003-01112008	VOS Manual Weather Station	10 - Selected	01 November 2008	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	MAERSK INNOSHIMA	Container ships
NL-VOS-OXHV2-19112008	VOS Manual Weather Station	30 - VOSClim	19 November 2008	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	EVELYN MAERSK	Container ships
NL-VOS-OXOR2-08122008	VOS Manual Weather Station	30 - VOSClim	08 December 2008	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	EDITH MAERSK	Container ships
NL-VOS-VRGW2-29012009	VOS Manual Weather Station	30 - VOSClim	29 January 2009	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	MAERSK SALINA	Container ships
NL-VOS-OWKI2-06052009	VOS Manual Weather Station	30 - VOSClim	06 May 2009	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	LAURA MAERSK	Container ships
NL-VOS-PBOF-29012010	VOS Manual Weather Station	30 - VOSClim	29 January 2010	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	DAMGRACHT	General Cargo
NL-VOS-PBSY-29012010	VOS Manual Weather Station	30 - VOSClim	29 January 2010	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	DONAUGRACHT	General Cargo
NL-VOS-PBQK-17062011	VOS Manual Weather Station	30 - VOSClim	17 June 2011	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	PLANCIUS	Passenger ferries
NL-VOS-9V2005-01072007	VOS Manual Weather Station	30 - VOSClim	01 July 2007	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	MAERSK INVERNESS	Container ships
NL-VOS-ZDND7-01012000	VOS Manual Weather Station	30 - VOSClim	01 January 2000	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	IVER EXACT	Liquid Tankers

REFERENCE	TYPE	MODEL	DEPLOYMENT DATE	COUNTRY	DEPLOYMENT COUNTRY	MASTER PROGRAM	PROGRAM	PROGRAM MANAGER	DEPLOYMENT SHIP	SHIP TYPE
NL-VOS-YJRJ3-18022015	VOS Manual Weather Station	30 - VOSClim	18 February 2015	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	REMBRANDT VAN RIJN	Passenger ferries
NL-VOS-5BMC3-15092015	VOS Manual Weather Station	30 - VOSClim	15 September 2015	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	ORTELIUS	Passenger Ships
NL-VOS-PCFS-28102015	VOS Manual Weather Station	30 - VOSClim	28 October 2015	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	ALP CENTRE	Tugs
NL-VOS-PDBP-19022016	VOS Manual Weather Station	30 - VOSClim	19 February 2016	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	SLOTTERGRACHT	General Cargo
LOCO-IRMINGSEA/OS_IRMINGSEA-1	Subsurface Moored Station	OceanSITE S Subsurface	30 August 2003	Netherlands		Ocean SITES	OS-NIOZ	Laura de Steur		
NL-VOS-PCJF-14062016	VOS Manual Weather Station	10 - Selected	14 June 2016	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	MINERVAGRACHT	General Cargo
3901889	Float	ARVOR	06 April 2017	Netherlands	Netherlands	Argo	MOCCA-NETH	Andreas Sterl	PLANCIUS	Passenger ferries
3901885	Float	ARVOR	19 December 2016	Netherlands	Netherlands	Argo	MOCCA-NETH	Andreas Sterl	PLANCIUS	Passenger ferries
3901886	Float	ARVOR	24 March 2017	Netherlands	Netherlands	Argo	MOCCA-NETH	Andreas Sterl	PLANCIUS	Passenger ferries
3901888	Float	ARVOR	25 February 2017	Netherlands	Netherlands	Argo	MOCCA-NETH	Andreas Sterl	PLANCIUS	Passenger ferries
3901884	Float	ARVOR	14 April 2017	Netherlands	Netherlands	Argo	MOCCA-NETH	Andreas Sterl	PLANCIUS	Passenger ferries
3901887	Float	ARVOR	13 April 2017	Netherlands	Netherlands	Argo	MOCCA-NETH	Andreas Sterl	PLANCIUS	Passenger ferries
3901883	Float	ARVOR	28 January 2017	Netherlands	Netherlands	Argo	MOCCA-NETH	Andreas Sterl	PLANCIUS	Passenger ferries
3901882	Float	ARVOR	04 March 2017	Netherlands	Netherlands	Argo	MOCCA-NETH	Andreas Sterl	PLANCIUS	Passenger ferries
3901881	Float	ARVOR	22 January 2017	Netherlands	Netherlands	Argo	MOCCA-NETH	Andreas Sterl	PLANCIUS	Passenger ferries
3901880	Float	ARVOR	20 April 2017	Netherlands	Netherlands	Argo	MOCCA-NETH	Andreas Sterl	PLANCIUS	Passenger ferries
3901879	Float	ARVOR	03 April 2017	Netherlands	Netherlands	Argo	MOCCA-NETH	Andreas Sterl	PLANCIUS	Passenger ferries
3901878	Float	ARVOR	19 April 2017	Netherlands	Netherlands	Argo	MOCCA-NETH	Andreas Sterl	PLANCIUS	Passenger ferries
3901877	Float	ARVOR	21 October 2016	Netherlands	Netherlands	Argo	MOCCA-NETH	Andreas Sterl	PLANCIUS	Passenger ferries
3901876	Float	ARVOR	17 October 2016	Netherlands	Netherlands	Argo	MOCCA-NETH	Andreas Sterl	PLANCIUS	Passenger ferries
NL-VOS-PFAQ-01112016	VOS Manual Weather Station	10 - Selected	01 November 2016	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	SCHELDEGRACHT	General Cargo
NL-VOS-PBSZ-28022017	VOS Manual Weather Station	30 - VOSClim	28 February 2017	Netherlands		SOT	VOS-NL	Sandra van Dijke-Langezaal	DOLFIJNGRACHT	General Cargo

All information included in Table 1 is derived from the JCOMMOPS database, <http://www.jcommops.org/>. In total 349 platforms have been deployed.

Table 2 List of programme managers include in the JCOMMOPS database

PROGRAM MANAGERS	ORGANISATION	TEL	EMAIL
Sandra van Dijke-Langezaal	KNMI	030 2206484	sandra.van.dijke@knmi.nl
Roy Mandersloot	KNMI		mandersl@knmi.nl
Harry Pannekeet	Datawell		sales@datawell.nl
René Rozeboom	KNMI		rene.rozeboom@knmi.nl
Andreas Sterl	KNMI	030 2206766	andreas.sterl@knmi.nl
Laura de Steur	NIOZ	0222 369 411	laura.de.steur@nioz.nl

Table 3 List of Dutch research vessels, included in the JCOMMOPS database.

NAME	ICES CODE	CS
ARCA	64AB	PDHT/IMO:9167966
ARGUS	64AS	PBVR/IMO:8404185
DELTA	64DE	PDPC/IMO:9104718
ESPERANZA	64EZ	PD6464/IMO:8404599
ISIS	64SS	PBXD/IMO:8318180
L'ESPOIR	64LE	PFPY/IMO: 7024550
LUCTOR	64LC	PFQN/IMO:8510697
MITRA	64MB	PBZW/IMO:8109266
PELAGIA	64PE	PGRQ/IMO:9001461
TRIDENS	64T2	PBVO/IMO:8821852
TRIDENS 1	64T1	PIAO/IMO:6812833
TYRO	64TR	PIBQ/IMO:6718427
ZIRFAEA	64ZF	PBZV/IMO:9046497

Different phases of The Ocean Cleanup project

The activities of The Ocean Cleanup have been structured in different phases. As shown in Figure 1, we can distinguish five phases: conceptual design, feasibility study, up-scaling testing, large-scale testing operational pilot, and implementation. The up-scaling testing and large-scale operational pilot have been categorized as oceanographic field research. As described above, we argue that these activities can be characterized as MSR, provided that The Ocean Cleanup complies with the obligations such as following a scientific method and publication of the results.

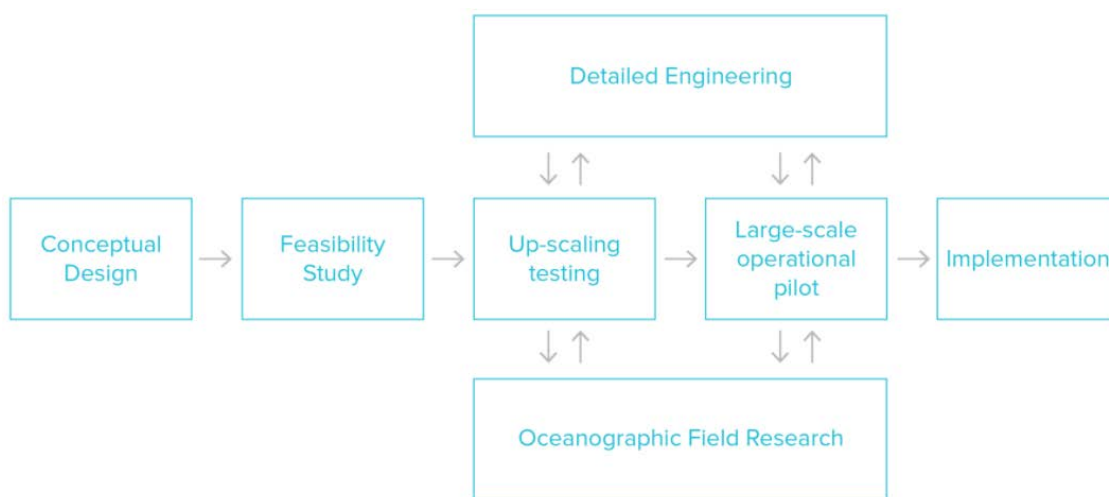


Figure 1

The Ocean Cleanup does not categorise the implementation phase as oceanographic field research, however we argue that still this phase can be considered as MSR. The Ocean Cleanup arrays system is a totally new concept and while implementing it in the North Pacific ocean, we contend that only after a few years, the results can be known. Therefore, even in its implementation phase, The Ocean Cleanup arrays are still experimental. The concept has not proven itself of cleaning up large areas of ocean plastic until it has been carried out and assessed. To strengthen the MSR status this phase, the arrays could be equipped with sensors and instruments, such as those attached to argo floats. It would be interesting to seek cooperation with Dutch partners, such as the KNMI. Further comparison can be made to research regarding oil spills. Oil spills research is an ongoing activity that coincides with

cleaning up.⁹⁷ Especially if new techniques are being used, the activities, or part of activities may be considered as research, and long term effects are monitored.

Acquiring the MSR status for The Ocean Cleanup activities

Governmental accreditation

There is no public information available how MSR is accredited by the Dutch government. The Dutch *Noordzeeloket* ('North Sea one-stop shop'), a body within the department of the Ministry of Infrastructure and Environment, functions as contact point for permission for MSR in the Dutch coastal waters. Within the *Noordzeeloket*, all relevant ministries participate, such as the Ministry of Economic Affairs and Ministry of Defence. The *Noordzeeloket* website lists a number of research institutes that carry out scientific research in the North Sea. These are included in Table 4. Dutch scientific research is coordinated by the Netherlands Organisation for Scientific Research (NWO), which is part of the Ministry of Education, Culture and Science.⁹⁸ NIOZ is one of the NWO scientific institutes, but NWO also funds other research organisations.

Table 4

Research organisation	Part of	Research field
Alterra	Wageningen University	Strategic and applied research on the marine environment at local, national and international scale, relationship between nature and society in marine areas
Deltares	Independent	Water, subsoil, infrastructures in deltas, coastal regions and river areas. Themes: water safety, ecosystems and environmental quality, water and raw materials, building in the delta, and sustainable development
IMARES	Wageningen University	Marine ecological research
TNO	Independent	Applied scientific research
MARIS	Independent	Developing and operating marine and oceanographic data management services
NHI	Royal Netherlands Navy	Hydrographic research
NILOS	Utrecht University	International law of sea-related issues
NIOO-KNAW	KNAW	Individual organisms, populations, ecological communities and ecosystems
NIOZ	NWO	Marine systems, integrating natural sciences relevant to marine research: physics, chemistry, geology and biology.

⁹⁷ See the oil spills research programme of the US at Oil Spills Research, <https://www.epa.gov/land-research/oil-spills-research>, accessed 14 July 2017.

⁹⁸ NWO, <https://www.nwo.nl/>, accessed 14 July 2017.

WVL	Rijkswaterstaat	Water, transport and living Environment
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The Ocean Cleanup arrays under Dutch law

Wegelein uses the term platform as an umbrella terms for ‘all possible carriers of sensors used in marine scientific research.’⁹⁹ In his definition, this would include anything from the smallest drifting buoy to ship and aircrafts, and installations. Wegelein defines vessels and ships, as crafts being used or capable for transportation.¹⁰⁰ Installations, on the other hand, can be any object on or below the surface that does not qualify as ship.¹⁰¹ But as Wegelein also points out, LOSC does not define ships and installation and it is up to the national legislator to regulate which objects qualify as ship and are eligible for a ‘flag’.

The new design of The Ocean Cleanup array consists of a floating barrier up to 2km width with deep sea anchors moving slowly with the currents. At first sight, the arrays can be qualified as an installation as they are not meant for transportation. However, the Dutch law is very broad. Article 8:1 of the Civil Code (BW, *Burgerlijk Wetboek*) defines ships:

*In dit wetboek worden onder schepen verstaan alle zaken, geen luchtvaartuig zijnde, die blijkens hun constructie bestemd zijn om te drijven en drijven of hebben gedreven.*¹⁰²

Additionally, the Dutch law on ships can also be applied to other structures, if assigned by regulation. Art. 8:2 lid 1 BW defines a sea vessel as a vessel that is registered as a sea ship or if the construction is solely or principally intended for floating at sea. In the *S&S* case, the Dutch Supreme Court defined when a construction is solely or principally intended for floating at sea.¹⁰³ The Court indicated two criteria, based on the parliamentary history, for the definition of floating: 1) based on the construction, it has to be intended for floating, and 2) it is floating or it has done so in the past.¹⁰⁴ The Court decided that also a drilling platform attached to the sea bed could be considered a ship as it had been floating during transportation. When the construction is altered so it can no longer float, it will end being a ship. Applying this definition to the Ocean Cleanup arrays, we can imagine that the arrays may qualify as ships under Dutch

⁹⁹ Wegelein (n 6) 121.

¹⁰⁰ *ibid* 122. See also Jan Babicz, *Wärtsilä Encyclopedia of Ship Technology* (2015 2nd ed. Wärtsilä) 559.

¹⁰¹ Wegelein (n 6) 135.

¹⁰² Article 8:1 *Burgerlijk Wetboek*.

¹⁰³ HR 28 May 2004, ECLI:NL:HR:2004:AP0226 (*S&S*) 13.

¹⁰⁴ *ibid*.

law, especially if a collection platform would be permanently attached to the array.¹⁰⁵ However, the issue before the Court was not related to international law questions, but rather on a dispute regarding national tax law. We assume that the Dutch government would regulate its MSR according international practice and we would like to point to the possibility for qualifying the arrays as installations. Reviewing the data of JCOMMOPS, we suggest that the distinction between vessels and installations is made according the intention of transportation. Although Part XIII of LOSC does not make any difference between vessels and installations, it might have consequences for obligations regarding safety and liability issues.

Conclusions

We are strongly convinced that certain activities of The Ocean Cleanup could qualify as MSR. Especially during the up-scaling and large-scale operational pilot phases the activities as sea would meet the criteria of MSR. In our view, also the implementation phase could be seen as MSR, as the implementation continues to be an ‘experiment’ on a larger scale. Only when the cleanup method has proven its success, further deployments may no longer serve as MSR.

Whether The Ocean Cleanup should seek such a status depends on whether the benefits outweigh the efforts The Ocean Cleanup has to make for acquiring this status. So far, we discussed an MSR status by the Dutch government, as the Dutch government is strongly endorsing the project. However, this does not mean that an MSR status provided by another state, or by more states at the same time, is not possible.

¹⁰⁵ This was the case in the previous design where a SWATH vessel would be used for the collection of plastic, Feasibility Study, 266.

Annexes

Annex I: Part XIII of LOSC

PART XIII MARINE SCIENTIFIC RESEARCH

SECTION 1. GENERAL PROVISIONS



Article 238

Right to conduct marine scientific research

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.



Article 239

Promotion of marine scientific research

States and competent international organizations shall promote and facilitate the development and conduct of marine scientific research in accordance with this Convention.



Article 240

General principles for the conduct of marine scientific research

In the conduct of marine scientific research the following principles shall apply:

- (a) marine scientific research shall be conducted exclusively for peaceful purposes;
- (b) marine scientific research shall be conducted with appropriate scientific methods and means compatible with this Convention;
- (c) marine scientific research shall not unjustifiably interfere with other legitimate uses of the sea compatible with this Convention and shall be duly respected in the course of such uses;

(d) marine 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.



Article 241

Non-recognition of marine scientific research activities

as the legal basis for claims

Marine scientific research activities shall not constitute the legal basis for any claim to any part of the marine environment or its resources.

SECTION 2. INTERNATIONAL COOPERATION



Article 242

Promotion of international cooperation

1. States and competent international organizations shall, in accordance with the principle of respect for sovereignty and jurisdiction and on the basis of mutual benefit, promote international cooperation in marine scientific research for peaceful purposes.

2. In this context, without prejudice to the rights and duties of States under this Convention, a State, in the application of this Part, shall provide, as appropriate, other States with a reasonable opportunity to obtain from it, or with its cooperation, information necessary to prevent and control damage to the health and safety of persons and to the marine environment.



Article 243

Creation of favourable conditions

States and competent international organizations shall cooperate, through the conclusion of bilateral and multilateral agreements, to create favourable conditions for the conduct of marine scientific research in the marine environment and to integrate the efforts of scientists in studying the essence of phenomena and processes occurring in the marine environment and the interrelations between them.



Article 244

Publication and dissemination of information and knowledge

1. States and competent international organizations shall, in accordance with this Convention, make available by publication and dissemination through appropriate channels information on proposed major programmes and their objectives as well as knowledge resulting from marine scientific research.

2. For this purpose, States, both individually and in cooperation with other States and with competent international organizations, shall actively promote the flow of scientific data and information and the transfer of knowledge resulting from marine scientific research, especially to developing States, as well as the strengthening of the autonomous marine scientific research capabilities of developing States through, *inter alia*, programmes to provide adequate education and training of their technical and scientific personnel.

**SECTION 3. CONDUCT AND PROMOTION OF
MARINE SCIENTIFIC RESEARCH**



Article 245

Marine scientific research in the territorial sea

Coastal States, in the exercise of their sovereignty, have the exclusive right to regulate, authorize and conduct marine scientific research in their territorial sea. Marine scientific research therein shall be conducted only with the express consent of and under the conditions set forth by the coastal State.



Article 246

Marine scientific research in the exclusive economic zone

and on the continental shelf

1. 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.

2. Marine scientific research in the exclusive economic zone and on the continental shelf shall be conducted with the consent of the coastal State.

3. Coastal States shall, in normal circumstances, grant their consent for marine scientific research projects by other States or competent international organizations in their exclusive economic zone or on their continental shelf to be 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. To this end, coastal States shall establish rules and procedures ensuring that such consent will not be delayed or denied unreasonably.

4. For the purposes of applying paragraph 3, normal circumstances may exist in spite of the absence of diplomatic relations between the coastal State and the researching State.

5. Coastal States may however in their discretion withhold their consent to the conduct of a marine scientific research project of another State or competent international organization in the exclusive economic zone or on the continental shelf of the coastal State if that project:

(a) is of direct significance for the exploration and exploitation of natural resources, whether living or non-living;

(b) involves drilling into the continental shelf, the use of explosives or the introduction of harmful substances into the marine environment;

(c) involves the construction, operation or use of artificial islands, installations and structures referred to in articles 60 and 80;

(d) contains information communicated pursuant to article 248 regarding the nature and objectives of the project which is inaccurate or if the researching State or competent international organization has outstanding obligations to the coastal State from a prior research project.

6. Notwithstanding the provisions of paragraph 5, coastal States may not exercise their discretion to withhold consent under subparagraph (a) of that paragraph in respect of marine scientific research projects to be undertaken in accordance with the provisions of this Part on the continental shelf, beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured, outside those specific areas which coastal States may at any time publicly designate as areas in which exploitation or detailed exploratory operations focused on those areas are occurring or will occur within a reasonable period of time. Coastal States shall give reasonable notice of the designation of such areas, as well as any modifications thereto, but shall not be obliged to give details of the operations therein.

7. The provisions of paragraph 6 are without prejudice to the rights of coastal States over the continental shelf as established in article 77.

8. Marine scientific research activities referred to in this article shall not unjustifiably interfere with activities undertaken by coastal States in the exercise of their sovereign rights and jurisdiction provided for in this Convention.



Article 247

Marine scientific research projects undertaken

by or under the auspices of international organizations

A coastal State which is a member of or has a bilateral agreement with an international organization, and in whose exclusive economic zone or on whose continental shelf that organization wants to carry out a marine scientific research project, directly or under its auspices, shall be deemed to have authorized the project to be carried out in conformity with the agreed specifications if that State approved the detailed project when the decision was made by the organization for the undertaking of the project, or is willing to participate in it, and has not expressed any objection within four months of notification of the project by the organization to the coastal State.



Article 248

Duty to provide information to the coastal State

States and competent international organizations which intend to undertake marine scientific research in the exclusive economic zone or on the continental shelf of a coastal State shall, not less than six months in advance of the expected starting date of the marine scientific research project, provide that State with a full description of:

- (a) the nature and objectives of the project;
- (b) the method and means to be used, including name, tonnage, type and class of vessels and a description of scientific equipment;
- (c) the precise geographical areas in which the project is to be conducted;
- (d) the expected date of first appearance and final departure of the research vessels, or deployment of the equipment and its removal, as appropriate;
- (e) the name of the sponsoring institution, its director, and the person in charge of the project; and
- (f) the extent to which it is considered that the coastal State should be able to participate or to be represented in the project.



Article 249

Duty to comply with certain conditions

1. States and competent international organizations when undertaking marine scientific research in the exclusive economic zone or on the continental shelf of a coastal State shall comply with the following conditions:

- (a) ensure the right of the coastal State, if it so desires, to participate or be represented in the marine scientific research project, especially on board research vessels 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.

2. This article is without prejudice to the 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 for making internationally available the research results of a project of direct significance for the exploration and exploitation of natural resources.



Article 250

Communications concerning marine scientific research projects

Communications concerning the marine scientific research projects shall be made through appropriate official channels, unless otherwise agreed.



Article 251

General criteria and guidelines

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.



Article 252

Implied consent

States or competent international organizations may proceed with a marine scientific research project six months after the date upon which the information required pursuant to article 248 was provided to the coastal State unless within four months of the receipt of the communication containing such information the coastal State has informed the State or organization conducting the research that:

- (a) it has withheld its consent under the provisions of article 246; or
- (b) the information given by that State or competent international organization regarding the nature or objectives of the project does not conform to the manifestly evident facts; or
- (c) it requires supplementary information relevant to conditions and the information provided for under articles 248 and 249; or
- (d) outstanding obligations exist with respect to a previous marine scientific research project carried out by that State or organization, with regard to conditions established in article 249.



Article 253

Suspension or cessation of marine scientific research activities

1. A coastal State shall have the right to require the suspension of any marine scientific research activities in progress within its exclusive economic zone or on its continental shelf if:

- (a) the research activities are not being conducted in accordance with the information communicated as provided under article 248 upon which the consent of the coastal State was based; or
- (b) the State or competent international organization conducting the research activities fails to comply with the provisions of article 249 concerning the rights of the coastal State with respect to the marine scientific research project.

2. A coastal State shall have the right to require the cessation of any marine scientific research activities in case of any non-compliance with the provisions of article 248 which amounts to a major change in the research project or the research activities.

3. A coastal State may also require cessation of marine scientific research activities if any of the situations contemplated in paragraph 1 are not rectified within a reasonable period of time.

4. Following notification by the coastal State of its decision to order suspension or cessation, States or competent international organizations authorized to conduct marine scientific research activities shall terminate the research activities that are the subject of such a notification.

5. An order of suspension under paragraph 1 shall be lifted by the coastal State and the marine scientific research activities allowed to continue once the researching State or competent international organization has complied with the conditions required under articles 248 and 249.



Article 254

Rights of neighbouring land-locked

and geographically disadvantaged States

1. States and competent international organizations which have submitted to a coastal State a project to undertake marine scientific research referred to in article 246, paragraph 3, shall give notice to the neighbouring land-locked and geographically disadvantaged States of the proposed research project, and shall notify the coastal State thereof.

2. After the consent has been given for the proposed marine scientific research project by the coastal State concerned, in accordance with article 246 and other relevant provisions of this Convention, States and competent international organizations undertaking such a project shall provide to the neighbouring land-locked and geographically disadvantaged States, at their request and when appropriate, relevant information as specified in article 248 and article 249, paragraph 1(f).

3. The neighbouring land-locked and geographically disadvantaged States referred to above shall, at their request, be given the opportunity to participate, whenever feasible, in the proposed marine scientific research project through qualified experts appointed by them and not objected to by the coastal State, in accordance with the conditions agreed for the project, in conformity with the provisions of this Convention, between the coastal State concerned and the State or competent international organizations conducting the marine scientific research.

4. States and competent international organizations referred to in paragraph 1 shall provide to the above-mentioned land-locked and geographically disadvantaged States, at their request, the information and assistance specified in article 249, paragraph 1(d), subject to the provisions of article 249, paragraph 2.



Article 255

Measures to facilitate marine scientific research

and assist research vessels

States shall endeavour to adopt reasonable rules, regulations and procedures to promote and facilitate marine scientific research conducted in accordance with this Convention beyond their territorial sea and, as appropriate, to facilitate, subject to the provisions of their laws and regulations, access to their harbours and promote assistance for marine scientific research vessels which comply with the relevant provisions of this Part.



Article 256

Marine scientific research in the Area

All States, irrespective of their geographical location, and competent international organizations have the right, in conformity with the provisions of Part XI, to conduct marine scientific research in the Area.



Article 257

*Marine scientific research in the water column
beyond the exclusive economic zone*

All States, irrespective of their geographical location, and competent international organizations have the right, in conformity with this Convention, to conduct marine scientific research in the water column beyond the limits of the exclusive economic zone.

**SECTION 4. SCIENTIFIC RESEARCH INSTALLATIONS OR EQUIPMENT IN
THE MARINE ENVIRONMENT**



Article 258

Deployment and use

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.



Article 259

Legal status

The installations or equipment referred to in this section do not possess the status of islands. They have no territorial sea of their own, and their presence does not affect the delimitation of the territorial sea, the exclusive economic zone or the continental shelf.



Article 260

Safety zones

Safety zones of a reasonable breadth not exceeding a distance of 500 metres may be created around scientific research installations in accordance with the relevant provisions of this Convention. All States shall ensure that such safety zones are respected by their vessels.



Article 261

Non-interference with shipping routes

The deployment and use of any type of scientific research installations or equipment shall not constitute an obstacle to established international shipping routes.



Article 262

Identification markings and warning signals

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.

SECTION 5. RESPONSIBILITY AND LIABILITY



Article 263

Responsibility and liability

1. States and competent international organizations shall be responsible for ensuring that marine scientific research, whether undertaken by them or on their behalf, is conducted in accordance with this Convention.
2. States and competent international organizations shall be responsible and liable for the measures they take in contravention of this Convention in respect of marine scientific research conducted by other States, their natural or juridical persons or by competent international organizations, and shall provide compensation for damage resulting from such measures.

3. States and competent international organizations shall be responsible and liable pursuant to article 235 for damage caused by pollution of the marine environment arising out of marine scientific research undertaken by them or on their behalf.

SECTION 6. SETTLEMENT OF DISPUTES

AND INTERIM MEASURES



Article 264

Settlement of disputes

Disputes concerning the interpretation or application of the provisions of this Convention with regard to marine scientific research shall be settled in accordance with Part XV, sections 2 and 3.



Article 265

Interim measures

Pending settlement of a dispute in accordance with Part XV, sections 2 and 3, the State or competent international organization authorized to conduct a marine scientific research project shall not allow research activities to commence or continue without the express consent of the coastal State concerned.

Annex II: Draft standard form A: Application for consent to conduct Marine scientific research

Source: Division for Ocean Affairs and the Law of the Sea Office of Legal Affairs, 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 (United Nations, New York 2010)

Annex I	
Documents related to Part III of the guide	
Draft standard form A	
Application for consent to conduct Marine scientific research	
Date: _____	
1. General Information	
1.1 Cruise name and/or number:	
1.2 Sponsoring institution(s):	
Name:	
Address:	
Name of Director:	
1.3 Scientist in charge of the project:	
Name:	
Country:	
Affiliation:	
Address:	
Telephone:	
Fax:	
Email:	
Website (for CV and photo):	

1.4 Entity(ies)/Participant(s) from coastal State involved in the planning of the project:	
Name:	
Affiliation:	
Address:	
Telephone:	
Fax:	
Email:	
Website (for CV and photo):	

2. Description of Project

2.1 Nature and objectives of the project:

2.2 If designated as part of a larger scale project, then provide the name of the project and the organization responsible for coordinating the project:

2.3 Relevant previous or future research projects:

2.4 Previous publications relating to the project:

3. Geographical Areas

3.1 Indicate geographical areas in which the project is to be conducted (with reference in latitude and longitude, including coordinates of cruise track/way points)

3.2 Attach chart(s) at an appropriate scale (1 page, high-resolution) showing the geographical areas of the intended work and, as far as practicable, the location and depth of sampling stations, the tracks of survey lines, and the locations of installations and equipment.

4. Methods and means to be used

4.1 Particulars of vessel:	
Name:	
Type/Class:	
Nationality (Flag State):	
Identification Number (IMO/Lloyds No.):	
Website for diagram & specifications:	
Owner:	
Operator:	
Overall length (meters):	
Maximum draught (meters):	
Displacement/Gross tonnage:	
Propulsion:	
Cruising & maximum speed:	
Call sign:	
INMARSAT number and method and capability of communication (including emergency frequencies):	
Name of master:	
Number of crew:	
Number of scientists on board:	
Relevant documents required by international conventions and regulations:	
Other relevant information:	
4.2 Particulars of aircraft:	
Name:	
Make/model:	
Nationality (Flag state):	
Website for diagram & specifications:	

Annex I

Owner:	
Operator:	
Overall length (meters):	
Propulsion:	
Cruising & Maximum speed:	
Registration No.:	
Call sign:	
Method and capability of communication (including emergency frequencies):	
Name of pilot:	
Number of crew:	
Number of scientists on board:	
Details of sensor packages:	
Other relevant information:	

4.3 Particulars of Autonomous Underwater Vehicle (AUV):	
Name:	
Manufacturer and make/model:	
Nationality (Flag state):	
Website for diagram & specifications:	
Owner:	
Operator:	
Overall length (meters):	
Displacement/Gross tonnage:	
Cruising & Maximum speed:	
Range/Endurance:	
Method and capability of communication (including emergency frequencies):	
Details of sensor packages:	
Other relevant information:	

4.4 Other craft in the project, including its use:

4.5 Particulars of methods and scientific instruments		
Types of samples and measurements:	Methods to be used:	Instruments to be used:

4.6 Indicate nature and quantity of substances to be released into the marine environment:

4.7 Indicate whether drilling will be carried out. If yes, please specify:

4.8 Indicate whether explosives will be used. If yes, please specify type and trade name, chemical content, depth of trade class and stowage, size, depth of detonation, frequency of detonation, and position in latitude and longitude:

5. Installations and Equipment

Details of installations and equipment (including dates of laying, servicing, method and anticipated timeframe for recovery, as far as possible exact locations and depth, and measurements):

6. Dates

6.1 Expected dates of first entry into and final departure from the research area by the research vessel and/or other platforms:

6.2 Indicate if multiple entries are expected:

7. Port calls

7.1 Dates and names of intended ports of call:

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7.2 Any special logistical requirements at ports of call:

--

7.3 Name/address/telephone of shipping agent (if available):

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8. Participation of the representative of the coastal State

8.1 Modalities of the participation of the representative of the coastal State in the research project:

--

8.2 Proposed dates and ports for embarkation/disembarkation:

--

9. Access to data, samples and research results

9.1 Expected dates of submission to coastal State of preliminary report, which should include the expected dates of submission of the data and research results:

--

9.2 Anticipated dates of submission to the coastal State of the final report:

--

9.3 Proposed means for access by coastal State to data (including format) and samples:

--

9.4 Proposed means to provide coastal State with assessment of data, samples and research results:

--

9.5 Proposed means to provide assistance in assessment or interpretation of data, samples and research results:

--

9.6 Proposed means of making results internationally available:

--

10. Other permits submitted

10.1 Indicate other types of coastal state permits anticipated for this research (received or pending):

--

11. List of supporting documentation

11.1 List of attachments, such as additional forms required by the coastal State, etc.:

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Signature:

Contact information of the focal point:

Name:

Country:

Affiliation:

Address:

Telephone:

Fax:

Email: