

***Regulating geoengineering research through domestic environmental protection frameworks: Reflections on the recent Canadian ocean fertilization case***

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Abstract

*Field experiments related to the development of geoengineering technologies are now occurring in an increasing number of countries. Such projects are raising important questions about the adequacy of national environmental protection laws (EPLs) for regulating geoengineering activities, including their ability to enforce emerging international norms for geoengineering research.*

*This article considers the application of the Canadian Environmental Protection Act (CEPA) to a recent controversy over ocean iron fertilization off the coast of British Columbia.<sup>1</sup> This incident provides an important precedent for analyzing existing domestic legislation and administrative measures being called upon to regulate geoengineering activities outside of the laboratory. To date, the attention of legal scholars has mostly focused on the content and adequacy of international rules.<sup>2</sup> However, as this case illustrates, the interpretation and implementation of these rules in domestic legal systems is critically important, as it is predominantly within domestic frameworks that such rules have direct legal effect on private and non-governmental actors. Our analysis highlights some key challenges for EPLs in regulating geoengineering activities, and draws some tentative conclusions regarding the structure of domestic environmental protection frameworks for regulating geoengineering*

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<sup>1</sup> *Canadian Environmental Protection Act, 1999*, S.C. 1999, c.33.

<sup>2</sup> See e.g., Karen Scott, "International Law in the Anthropocene: Responding to the Geoengineering Challenge" 34 *Mich. J. Int'l L.* (2012); Edward Parsons and Lin Ernst, "International Governance of Climate Engineering", forthcoming *Theoretical Inquiries in Law* (2013), available online at <http://ssrn.com/abstract=2157754>. R. Bodle, with Homan, G., Schiele, S., and E. Tedsen (2012). "The Regulatory Framework for Climate-Related Geoengineering Relevant to the Convention on Biological Diversity" in Part II of: *Geoengineering in Relation to the Convention on Biological Diversity: Technical and Regulatory Matters*. Secretariat of the Convention on Biological Diversity. Montreal, Technical Series No. 66.

research.<sup>3</sup>

## I. The 2012 HSRC Ocean Fertilization Controversy

In October, 2012, it was widely reported in the international media that in August 2012 the Haida Salmon Restoration Corporation (HSRC) had deposited roughly 100 tonnes of iron sulphate into the Pacific Ocean off the west coast of Canada, inducing a large algal bloom covering about a 10,000 km<sup>2</sup> area of the ocean.<sup>4</sup> The principals involved in the activity characterized it as an ocean “restoration” project, aimed at enhancing decreasing salmon stocks.<sup>5</sup> However, they also made public statements indicating that they planned to generate revenue by attempting to sell carbon credits on international markets for the carbon dioxide they assumed would be sequestered by the project.<sup>6</sup> The HSRC is wholly owned by the Old Masset Village Council, which is part of the Haida First Nation located on Haida Gwaii; an archipelago on the north coast of Canada’s west coast in British Columbia. Adding to the controversy, the HSRC deposition project involved the controversial former chief executive of Planktos Inc., Russ George, who had previously attempted to run (and was prevented by the relevant governmental authorities from running) large-scale ocean fertilization activities near the Galapagos and Canary Islands.<sup>7</sup>

Once it was made public, this ocean fertilization project was widely condemned by environmental groups, scientists, and international organizations engaged in

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<sup>3</sup> Bodle et al., “Regulatory Frameworks”, supra, note 2.

<sup>4</sup> Martin Lukacs, “World’s biggest geoengineering experiment ‘violates’ UN Rules”, *The Guardian*, 15 October 2012.

<sup>5</sup> *Ibid.* (quoting Russ George).

<sup>6</sup> “West Coast ocean fertilization project defended”, CBC News, 19 October, 2012, available online at: <http://www.cbc.ca/news/canada/british-columbia/story/2012/10/19/bc-ocean-fertilization-haida.html?cmp=rss> (last accessed March 7, 2012) (noting intent of HSRC to claim credits, but also citing experts that credits for such a scheme not likely).

<sup>7</sup> United States submission to the International Maritime Organization, Scientific Groups of the London Convention and Protocol, *Planktos, Inc. Large-scale Ocean Iron Addition Projects*, (LC/SG 30/INF.28, 1 June 2007) See also, Rosemary Rayfuse, Mark G. Lawrence, and Kristina M. Gjerde, “Ocean Fertilization and Climate Change: The Need to Regulate Emerging High Seas Uses” 23 *Int’l J. Marine & Coastal L.* (2008), p.319; Mark Hume, “Designer of controversial ocean project tried similar experiment in the past”, *The Globe and Mail*, 25 October 2012.

geoengineering governance.<sup>8</sup> Environment Canada (EC) — the domestic environmental regulator responsible for ocean disposal — acknowledged that its officials were consulted in the project development stage, though they indicated that no approvals for the activity were sought or granted. EC has launched an investigation of the incident to determine if Canadian law was violated. As of the publication of this article, EC has executed a search warrant on the HRSC offices and seized materials related to the deposition project, and the HRSC responded by filing suit to have these materials returned. In addition, the HRSC has recently stated publically that they intend to conduct another ocean iron deposition project in the summer of 2014.<sup>9</sup>

## II. Situating the HSRC Case within Canadian Environmental Law

The principal Canadian law that regulates disposal at sea is found in Part 7, Division 3 of *CEPA*.<sup>10</sup> The aim of this division is the protection of the marine environment, in particular, by implementing Canada's international legal obligations under the *London Convention* (LC) and its *Protocol* (LP).<sup>11</sup> The division regulates the disposal of substances in areas of the sea under Canadian jurisdiction and disposal activities conducted by Canadian vessels regardless of their location. In accordance with the more precautionary "reverse-list" approach adopted under the LP, *CEPA* provides for a limited number of prescribed exceptions to the general prohibition against the dumping of wastes and other matter. However, for these excepted substances, the disposal at sea may only occur where a person

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<sup>8</sup> The condemnations included a statement issued by the Contracting Parties to the *London Convention* and *London Protocol* (LC-LP) expressing their "grave concern" over the incident. "Statement of Concern Regarding the Iron Fertilization in Ocean Waters West of Canada", 2 November, 2012, Report of the 34<sup>th</sup> Consultative Meeting of the Contracting Parties to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (London Convention) and 7<sup>th</sup> Meeting of Contracting Parties to the 1996 Protocol thereto (London Protocol), (LC 34/15, 23 November 2012), Annex 3.

<sup>9</sup> Judith Lavoie, "Haida Ready for second test of iron dumping; Corporation wants Environment Canada to return data, samples seized last month", *Times Colonist (Victoria)*, p.A4, April 21, 2013.

<sup>10</sup> *CEPA*, *supra* note 1, ss.122-137.

<sup>11</sup> *CEPA*, *supra* note 1, s.122.1; *Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter*, in force 30 August 1975, 11 *International Legal Materials* (1972) pp. 1358 *et seq.*, Protocol to the 1972 London Dumping Convention, in force 24 March 2006, 36 *International Legal Materials* (1997) pp. 7 *et seq.*

has applied for and received a permit.<sup>12</sup> An application for a permit under this part triggers the federal environmental assessment process, which ensures that the environmental impacts of the disposal activities on the marine environment are accounted for in the permitting process.<sup>13</sup> The *CEPA* disposal at sea rules do not expressly address ocean fertilization activities or marine geoengineering, although as described below, EC has issued interpretive documents describing the application of the disposal at sea rules to ocean fertilization. According to EC, these documents were provided to the HSRC principals during their initial consultations.

For the *CEPA* rules on disposal at sea to apply to the HSRC deposition, two criteria must be met: the deposition itself or the vessel that conducted the deposition must have been under Canadian jurisdiction at the time of the deposition; and the deposition must constitute an act of “disposal” that is covered by the *CEPA* rules.<sup>14</sup>

The HSRC principals indicated that the iron sulphate was added outside of Canadian territorial waters and exclusive economic zone,<sup>15</sup> an assertion confirmed by public satellite data. Since the incident occurred on the high seas, *CEPA* only applies if either (a) the vessel in question was “registered” in Canada, or (b) the deposited materials were loaded onto the vessel in Canada.<sup>16</sup> On the publicly known facts, it appears that the material deposited was sourced in Alberta and transported to the coast, where it was loaded onto the vessel in British Columbia with the express purpose of deposition at sea. The registration of the ship is still unknown, but there is at present no evidence that the incident involved a foreign vessel. There are some indications that the project proponents might raise jurisdictional obstacles based on a claim of First Nation sovereignty — for example, by claiming that the

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<sup>12</sup> *Ibid.* s.127.

<sup>13</sup> *Canadian Environmental Assessment Act*, S.C. 2012. C.19, s.5.

<sup>14</sup> *CEPA*, *supra* note 1, s.122.

<sup>15</sup> Defined in Art. 57 of the *United Nations Convention on the Law of the Sea* (UNCLOS), adopted 10 December 1982, 499 *U.N.T.S.* pp. 1358 *et seq.* as a zone not extending beyond the 200 nautical mile limit as measured from the coastal baseline.

<sup>16</sup> *Ibid.* s.124 (prohibiting loading a substance in Canada for disposal at sea), s.125(2) (prohibiting the disposal at sea by Canadian vessels).

vessel was flagged with an Old Masset Village flag — but these issues are unique to this particular case, and do not inform the broader analysis here.<sup>17</sup>

Assuming that Canada has jurisdiction over the incident (which based on the current facts seems likely),<sup>18</sup> the second, more problematic issue that arises is whether the activity in question constitutes “disposal.” The definition of “disposal” under *CEPA* mirrors the definition of “dumping” under the LC and LP and includes “the deliberate disposal of a substance at sea from a ship.”<sup>19</sup> However, following the wording in the LC and LP, the *CEPA* definition excludes “the placement of a substance for a purpose other than its mere disposal if the placement is not contrary to the purposes of this Division and the aims of the [London] Convention and [London] Protocol”.<sup>20</sup> This is a significant exception, which could potentially exclude the HSRC activity, since the placement of the iron sulphate (or other materials) was ostensibly for scientific and instrumental purposes; i.e., it was introduced deliberately for a purpose other than its mere disposal. This ambiguity concerning the interpretation of the placement exception lies at the heart of the current debates with the LC-LP regime respecting the application of international ocean dumping rules to ocean fertilization activities.<sup>21</sup> Because the Canadian rules simply incorporate the international rules with little modification, the legality of the HSRC activity turns on whether the deposition is determined to be “contrary to the purposes” of the LC-LP.

### III. The Connection to International Law on Ocean Fertilization

The overarching objective of the LC and LP is to prevent marine pollution by the dumping of waste or other matter that is liable to create hazards to human health, to harm living

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<sup>17</sup> A discussion of the potential complications arising from Aboriginal rights claims is beyond the scope of this paper, but see Thomas Isaac, *Aboriginal Law: Commentary and Analysis* (Saskatoon: Purich Press, 2012).

<sup>18</sup> Leaders of the Haida First Nation from outside Old Masset village have also rejected the claim of extra-judicial sovereignty over the HSRC’s project.

<sup>19</sup> *CEPA*, *supra* note 1, s.122 (definition of “disposal”). *London Convention*, *supra* note 11, Art. III(1) (definition of “dumping”). *London Protocol*, *supra* note 11, Art. 1(4) (definition of “dumping”).

<sup>20</sup> *CEPA*, *ibid*, s.122.

<sup>21</sup> See K. Scott, this issue; Rayfuse et al., *supra* note 6; Philomène Verlaan, “Current Legal Developments: London Convention and London Protocol” 26 *Int’l J. Marine & Coastal L.* (2011).

resources and marine life, to damage amenities, or interfere with other legitimate uses of the sea.<sup>22</sup> Given this broad wording, this objective provides only general guidance in clarifying whether a particular activity conforms to the aims of the LC and LP, particularly where the purpose of the activity in question is to experimentally assess the environmental harms and benefits of an activity, such as ocean fertilization. Because of this ambiguity and due to earlier international concerns arising in relation to unregulated ocean fertilization experiments including those proposed by Planktos Inc., the Contracting Parties have sought to clarify the application of the LC-LP rules to ocean fertilization activities.<sup>23</sup>

In response to concerns raised at that time, the Contracting Parties adopted Resolution LC-LP.1 in 2008, which affirmed that ocean fertilization activities fell within the regulatory scope of the LC-LP, and that, “given the present state of knowledge, ocean fertilization activities other than legitimate scientific research, should not be allowed... [And] should be considered as contrary to the aims of the Convention and Protocol.”<sup>24</sup> “Legitimate scientific research” was defined as those proposals which have been assessed and found acceptable using an agreed upon assessment framework to be developed subsequently by the Scientific Groups.<sup>25</sup> In 2010, the Contracting Parties adopted Resolution LC-LP.2, establishing an “Assessment Framework for Scientific Research Involving Ocean Fertilization” (Assessment Framework).<sup>26</sup> This document describes the assessment requirements that proposed ocean fertilization experiments should undergo before they will be considered legitimate scientific research.

The series of non-binding resolutions on ocean fertilization adopted under the LC-LP together with the precautionary approach provide the substantive backdrop for the largely

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<sup>22</sup> *London Convention*, *supra* note 11, Art. I. *London Protocol*, *supra* note 11, Art. 2.

<sup>23</sup> “Statement on Ocean Fertilization”, 14 December 2007, *Report of the 29<sup>th</sup> Consultative Meeting of the Contracting Parties to the London Convention and 2<sup>nd</sup> Meeting of the Contracting Parties to the London Protocol*, (LC 29/17), para. 4.23.

<sup>24</sup> Resolution LC-LP.1 (2008) on the Regulation of Ocean Fertilization, (adopted on 31 October 2008), 9 December 2008, *Report of the 30<sup>th</sup> Consultative Meeting of the Contracting Parties to the London Convention and 3<sup>rd</sup> Meeting of the Contracting Parties to the London Protocol*, (LC 30/16), Annex 6, paras. 1 & 8

<sup>25</sup> *Ibid*, para. 4 & 7.

<sup>26</sup> Resolution LC-LP.2 (2010) on the Assessment Framework for Scientific Research Involving Ocean Fertilization (adopted on October 14 2010), 9 November 2010, *Report of the 32<sup>nd</sup> Consultative Meeting of the Contracting Parties to the London Convention and 5<sup>th</sup> Meeting of the Contracting Parties to the London Protocol*, (LC 30/16), Annex 6.

procedural content in the Assessment Framework.<sup>27</sup> Instead of parsing out specific activities or outcomes that would be subject to regulation, the document requires extensive assessment, disclosure, consultation, and monitoring. The Assessment Framework is geared towards determining whether the proposed activity poses an unacceptable environmental risk, and whether it exhibits “proper scientific attributes”. Such attributes include the requirements that: the proposed research and its outcomes are not motivated by direct financial gain; the project is subjected to scientific peer review; and that the results are published in peer reviewed scientific publications.

Both resolutions are legally non-binding, but do clearly indicate the Parties’ view that unregulated and non-assessed ocean fertilization activities are inconsistent with the purposes of the LC-LP. But this provides little clarity when considering the weight to be given to these instruments when interpreting *CEPA*.<sup>28</sup> This current legal uncertainty has been a strong stimulus of current discussions amongst the Parties regarding the need for a clear, legally binding mechanism.<sup>29</sup>

The Canadian government voted with other Contracting Parties in support of both resolutions, which were adopted by consensus. In line with this, EC issued an Information Bulletin stating explicitly that Canada is following the interpretations of the LC-LP contained in Resolutions LC-LP.1 and LC-LP.2. Accordingly, this document states clearly that, as a matter of domestic law, ocean fertilization activities are considered disposal at sea

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<sup>27</sup> *London Protocol*, *supra* note 11, Art. 3(1).

<sup>28</sup> A formal “interpretive resolution” adopted in accordance with Art. 31(3)(a) of the *Vienna Convention on the Law of Treaties*, 1969 is amongst the legally binding options considered by the Parties to control ocean fertilization. *Report of the 3<sup>rd</sup> Meeting of the LP Intersessional Working Group on Ocean Fertilization* (adopted on 20 June 2011), (LC 33/4).. Churchill and *Ulfstein* have argued that resolutions from treaties bodies can, in fact, amount to authoritative interpretations that amount to subsequent practice by the Parties, which is recognized as an salient element to be accounted for in treaty interpretation under the *Vienna Convention on the Law of Treaties*, see Robin Churchill and Geir Ulfstein, “Autonomous Institutional Arrangements in Multilateral Environmental Agreements: A Little-noticed Phenomenon in International Law” 94 *AJIL* 623 (2000), 641, citing the *Vienna Convention on the Law of Treaties*, 23 May 1969, UNTS, v.1155, p.331 (in force 27 January 1980), Art.31(3)(b).

<sup>29</sup> The various proposals to create formally binding rules respecting ocean fertilization under the LC-LP are set out in Report of the 34<sup>th</sup> Consultative Meeting of the Contracting Parties to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (London Convention) and 7<sup>th</sup> Meeting of Contracting Parties to the 1996 Protocol thereto (London Protocol), (LC 34/15, 23 November 2012).

and thus currently not allowed under *CEPA*, and that therefore, any scientific experiment must demonstrate that it qualifies as legitimate by undertaking an oceans assessment.<sup>30</sup> The Information Bulletin provides that EC will review the completed oceans assessment (to be done in accordance with the Assessment Framework) and will render a decision, presumably, as to the adequacy of the assessment and, therefore, the legitimacy of the activity. In effect, the approach is to impose a *de facto* permitting scheme for ocean fertilization experiments, since there is a presumption that EC will be the sole arbiter of whether a proposed ocean fertilization experiment satisfies the requirements of the Assessment Framework.

The Information Bulletin has no formal legal status under Canadian law. It is not a product of a legislative or delegated rulemaking body, but appears to be a departmental guideline that, at best, provides interpretive direction. Its value is that it demonstrates Canada's understanding that the ocean fertilization resolutions were intended as interpretations of the LC and LP and it provides clear notice to those engaged on ocean fertilization research of the need to conduct an assessment. To be clear, the position of the Canadian government is that simply by virtue of the definition of disposal under *CEPA*, ocean fertilization is encompassed in the basic prohibition. EC regards scientific research on ocean fertilization as constituting a possible exception, so long as the proposed experiment is found to be legitimate. Returning to the HSRC case, EC has indicated that the Information Bulletin was provided to the HSRC principals when its officials were consulted by HSRC during the initial planning stages, prior to the launch of the deposition project. However, it is also clear that the HSRC did not feel compelled to comply with the requirements of the Information Bulletin or the LC-LP resolutions.

#### IV. Assessing *CEPA*'s Approach

The adequacy of the *CEPA* regime on ocean fertilization research ought to be assessed on the sufficiency of its coverage (i.e., are the rules likely to capture all incidents of concern),

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<sup>30</sup> Environment Canada, *Information Bulletin – Ocean fertilization activities are currently not allowed except for qualified research*, March 2011, available on the internet, <http://www.ec.gc.ca/iem-das/default.asp?lang=En&n=C53A7E26-1> (last accessed on 7 March, 2013).



the clarity of the rules, and the ease of their application and enforcement by regulatory officials. Applying the current scheme to the HSRC case gives us some sense of how these rules might operate. On the one hand, the recent HSRC case appears quite straight forward in the sense that the actions of the proponents appear quite out of step with Canadian and international expectations for assessment and consultation. On the other hand, the failure of HSRC to even pay lip service to the requirements raises serious questions about the normative ambiguity of the regulatory scheme.

The jurisdictional coverage of the rules is as extensive as it can be under prevailing international rules respecting prescriptive jurisdiction as recognized in UNCLOS, and includes activities on the high seas and in foreign waters undertaken by Canadian ships. The substantive coverage of the scheme is narrow in the sense that the scheme only addresses ocean fertilization — defined in general terms as those activities aimed at “stimulating primary productivity of the oceans”<sup>31</sup> — as opposed to geoengineering more generally. In this regard, the Canadian approach reflects the high degree of fragmentation that occurs in relation to geoengineering at the international level, where there is no clear regulatory body, and the current approach appears to be *ad hoc* regulation of geoengineering under a variety of regimes, where those regimes intersect with various proposed geoengineering techniques. However, given the highly diverse and rapidly evolving set of geoengineering techniques currently being discussed (each with their own unique set of potential environmental consequences of widely varying spatial and temporal scales), the fragmentation reflected by this scheme should not necessarily be seen as problematic. Rather, the narrowness of individual mechanisms to regulating the targeted purpose or objective of a set of geoengineering techniques — in this specific case, “stimulating primary productivity in the oceans” — provides a flexibility in the current governance landscape to develop tools suitable for each case.

Taken together, it is important to note that the *CEPA* approach is not likely to capture regulatory consideration of some of the broader questions associated with geoengineering more generally. Without rehearsing in detail what those concerns are, much of the debate around geoengineering has related to the underlying ethical implications of specific geoengineering proposals, especially as these relate to ongoing commitments to address climate change through greenhouse gas emissions reductions. The current *CEPA* ocean

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<sup>31</sup> Resolution LC-LP.1, *supra* n.24, para. 2.

fertilization scheme is not designed to be the mechanism for the consideration of the broader public policy discussions that will need to unfold over time. An approach which allows for controlled experimentation, while this debate occurs in domestic and international *fora*, can ensure that the debate is informed by scientific inquiry.<sup>32</sup> The Assessment Framework itself does require broad notification and consultation, and is designed to promote citizen engagement in the environmental and social issues that ocean fertilization field experiments may raise.<sup>33</sup>

The prohibition against non-legitimate scientific activities involving ocean fertilization in *CEPA* does not turn on the proof of harm or require regulators to make unguided assessments of the proponent's scientific intentions or qualifications. The virtue of the scheme is that its procedural orientation provides regulatory clarity, in the sense that the determinative legal issue is whether an assessment was undertaken in accordance with the Assessment Framework. Additionally, the scheme does not require national officials to characterize the exact purpose of the proposed research when considering whether to grant their approval to the experiment — which can easily be re-characterized for instrumental purposes — but rather focuses instrumentally on the procedures and outcomes of the proposed project under examination. In the case of HRSC incident, the Principals' claims to have undertaken the project to collect data for a variety of purposes, including salmon stock enhancement and carbon sequestration, are incidental to the requirement to complete an assessment, except where they reflect a non-scientific profit motive for the project.

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<sup>32</sup> The effectiveness of any national scheme to regulate geoengineering must be evaluated in light of the inherent limitations of laws and administrative measures taken solely at the domestic level to control the risks of such activities. Many geoengineering techniques, including ocean fertilization, are likely to have transboundary or global effects and thus favour international regulation with cooperation and coordination between states. Past experience already shows the jurisdictional obstacles that can arise when a single state attempts to control geoengineering on its own. In 2007, Planktos, Inc. was able to evade investigation by the U.S. Environmental Protection Agency under the *Marine Protection, & Sanctuaries Act* (also referred to as the Ocean Dumping Act) by changing to a vessel flying a different national flag and loading the iron in a different country. Ultimately, the U.S. had to appeal to the IMO and other states with appropriate jurisdiction to address this potential threat to the marine environment. See United States submission to the International Maritime Organization, Scientific Groups of the London Convention and Protocol, *Planktos, Inc. Large-scale Ocean Iron Addition Projects*, *supra* note 7.

<sup>33</sup> Assessment Framework, *supra* note 26, para.1.8.

Applying the scheme to the HSRC incident appears quite straightforward. The proponent admitted that the activity was undertaken with the intention of increasing primary productivity in the oceans, but no assessment was submitted to show that the activity falls within the scope of the research exemption in Resolution LC-LP.1. By failing to undertake or produce an assessment, that claim cannot provide an exception under the scheme since legitimacy is determined, in large part, by adherence to the requirements of the Assessment Framework.

Where the scheme falls short is in its highly ambiguous legal form. The issue here is that much of the scheme, namely the LC-LP resolutions and the Information Bulletin, are formally outside the *CEPA* framework and are, at best, incorporated into the scheme by reference. The incorporation is, however, inchoate. At the international level, resort to non-binding legal instruments (soft law) is commonplace and plays an important role in multi-lateral treaty-making processes.<sup>34</sup> In the case of LC-LP.1 and LC-LP.2, the approach allows the Parties to develop a common understanding of how the treaties should be applied and further developed as new environmental issues arise. Such an approach, while responding to the political and institutional constraints in negotiating formal legal agreements in multi-lateral settings, is also sensitive to tensions arising from encroachments on state sovereignty that are the result of evolving consensual agreements made through treaty bodies.<sup>35</sup> Applying this approach within domestic frameworks presents greater difficulties.<sup>36</sup>

The fundamental difficulty in the HSRC case is not a lack of clarity over EC's requirements. As noted, the process outlined in the Information Bulletin is straight forward. But the legal form is only well suited to regulate those actors who are predisposed to comply voluntarily.

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<sup>34</sup> Alan E. Boyle, "Some Reflections on the Relationship of Treaties and Soft Law" 48 *ICLQ* (1999), 901. See also Dinah Shelton, ed. *Commitment and Compliance: The Role of Non-binding Norms in the International Legal System* (Oxford: Oxford University Press, 2000); Patricia Birnie, Alan Boyle, and Catherine Redgwell, *International Law & the Environment*, 3<sup>rd</sup> Ed. (Oxford: Oxford University Press, 2009), pp. 34-37.

<sup>35</sup> This point underlies much of the work on compliance within the managerial (Chayesian) school, see Abram Chayes and Antonia Handler Chayes, *The New Sovereignty: Compliance with International Regulatory Agreements* (Cambridge, Mass.: Harvard University Press, 1995).

<sup>36</sup> For an analysis of the legal basis for authorization requirements for ocean fertilization under German law, see Alexander Proelss, "Legal Opinion on the Legality of the LOHAFEX Marine Research Experiment under International Law" (Kiel, Germany: 22 January 2009).

In the regulation of scientific research, one might assume that the scientific community is predisposed to voluntary compliance. The HSRC case (and perhaps Planktos before it) indicates quite starkly that this is not always the case, at least in instances where there is for example underlying direct profit motive for conducting such experiments. The regulation of private and non-governmental actors, who are motivated, as HSRC appeared to be, by a complex constellation of interests, must account for the possibility that regulatory subjects will not be responsive to collective goals, and will require harder, more coercive instruments. As a result of this approach, EC is now placed in the position where HSRC has clearly failed to comply with their scheme, notwithstanding that the requirements were brought to HSRC's attention. The only basis for EC not to proceed with a prosecution is that they understand the scheme to be enforceable.

The difficulty with the Information Bulletin becomes more apparent when we consider a case where the disagreement is not over whether the activity in question should be subject to an assessment, but rather over what constitutes an adequate assessment. The Information Bulletin seeks to impose an elaborate procedural framework that presently has no statutory authority. In essence, the approach is to create a permitting system for ocean fertilization experiments rooted in a determination of whether an activity is a "placement not contrary to the... aims of the Convention and the Protocol." In a case where EC refuses to allow a proposed experiment to proceed on the basis of its failure to adhere to the requirements of the Assessment Framework, the proponent may rightfully question a determination of whether an activity can be considered "disposal" (the underlying legal question) can be constrained by instruments that have not been enacted as formal law.

It is perhaps understandable that the Canadian government does not want to give a non-binding guidance document formal status under Canadian law, particularly where the legal options respecting the adoption of a legally binding mechanism to regulate ocean fertilization are currently being debated by the Parties to the LC-LP. Nevertheless, we do not see how conformity with the Assessment Framework can presently be compelled under Canadian law. In particular, the failure for a proponent to comply with some of the very specific requirements of the Assessment Framework — for example, that of there being no expected direct financial gain from the project — likely cannot be seen as determinative of a breach of *CEPA*. In our view, however, the HSRC incident provides an easier case, in that no

assessment was prepared and presented to public officials at EC for official permitting purposes.

## V. Lessons Learned

The first lesson to draw here is that domestic regulation of ocean fertilization is necessary. International law is by and large not addressed at private and non-governmental actors,<sup>37</sup> and, while some ocean fertilization research is likely to be carried out by publicly-funded scientific institutions whose activities can be controlled by state authorities, there is still a need to bind individuals and corporations. Past experience shows that the profit motive provides a powerful incentive for private actors to disregard voluntary regimes, and it thus cannot be taken for granted that all participants in ocean fertilization research will share the collective goals of the international community. Therefore, it should be emphasized in this regard that control and oversight over these potentially harmful activities carried out by private actors ultimately comes down to the state, and under UNCLOS, states have a duty to regulate companies and individuals and take measures to ensure that activities under their jurisdiction or control do not cause damage by pollution by dumping to the marine environment.<sup>38</sup> For the sake of effectiveness, some care must be taken to match the regulatory tools to the potential subjects of regulation. Compliance matters, and in the context of domestic regulation, compliance is most easily achieved through formally binding mechanisms backed up by effective enforcement mechanisms.

In a number of ways, the Canadian approach is sound. The focus on process as measured by adherence to the Assessment Framework results in a regulatory framework that encourages transparency and consultation in the research process and should not unduly burden scientific research. Indeed, it is not uncommon for research activities to be subject to assessments. The focus on legitimate scientific activities requires a separate process from traditional domestic environment assessment, which in turn requires the clear identification of the criteria by which legitimacy is to be established. The effective

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<sup>37</sup> Thilo Marauhn, "Changing Role of the State" in Daniel Bodansky, Jutta Brunée, and Ellen Hey, eds. *The Oxford Handbook of International Law* (Oxford : Oxford University Press, 2007).

<sup>38</sup> UNCLOS, Arts. 94, 194(1)-(2), and 210.

implementation of the Assessment Framework at the domestic level seems to be both efficient and provides for harmonization and cooperation at the international level (if other states adopt the Framework). International cooperation and coordination is also necessary for the protection of global commons areas beyond national jurisdiction, such as the high seas. However, the degree of both procedural and substantive specificity requires that the Assessment Framework be incorporated into national law through formal legal enactments. The referencing and incorporation of international standards and processes, such as ISO standards, into formal enactments is not uncommon in Canada and elsewhere and could have been accomplished through regulation here.

While the Canadian government may want to wait and see what the other Contracting Parties to the LC-LP end up deciding in terms of the formalization of an ocean fertilization scheme at the international level, the current approach, as the HSRC case demonstrates, is a second best, and interim solution to effective domestic regulation of ocean fertilization research activities.