

**Does International Marine Environment Law Work? An Examination of the
Cartagena Convention for The Wider Caribbean Region.**

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By Prof. Benedict Sheehy (c) 2004

Abstract: This study examines the effectiveness of international marine environment law in controlling and abating contamination of the marine environment in the Wider Caribbean Region. The main international agreement covering the region is the Cartagena Convention which came into force in 1983. This convention, initiated by the UNEP under its Regional Seas Program, is considered one of the most successful of the programs. The study examines that claim in light of events since the adoption of the Cartagena Convention by the majority of nations bordering on the region. Mexico, because of its stature as a leading Latin American nation, is used as a case study. The author concludes that the success of the program is questionable and makes various suggestions for improving the situation.

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1. INTRODUCTION: UNEP, REGIONAL SEAS AND CARTAGENA CONVENTION

In June 1972 the UN Conference on the Human Environment, in Stockholm, Sweden created the United Nations Environment Programme. Its task was to oversee all matters dealing with the environment addressed by the UN.¹ Among its responsibilities and successes is the Regional Seas Programme (hereinafter RSP).² The RSP has 13 agreements covering over 140 countries.³

The RSP's mandate, is to coordinate nations bordering on common seas on matters related to the prevention of environmental degradation of coastal regions, including inland waters, coastal waters and the open sea.⁴ It operates through a series of periodic meetings of high-level officials who develop an Action Plan.⁵ Simply put, "When the same problem crops up in every country, even if only on a local scale, then it becomes a common problem. All the countries of the region benefit by looking for a common solution."⁶ Essentially RSP tries to coordinate and convert those concerns into regional action plans.⁷

¹ United Nations Environment Programme, "About UNEP"

<http://www.unep.org/Documents/Default.asp?DocumentID=43&ArticleID=3301> .

² For an uptodate review of the entire program including reports from each of the Programmes, see Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, document "Regional Seas: Strategies for Sustainable Development." <http://www.gpa.unep.org/documents/finalrsb.pdf> at Sept 1, 2003.

³ RSP, "History of the Regional Seas Programme" (undated) source

<<http://www.unep.ch/seas/main/hhist.html>> at June 28, 2003 (hereinafter "History") no pagination

⁴ Ibid.

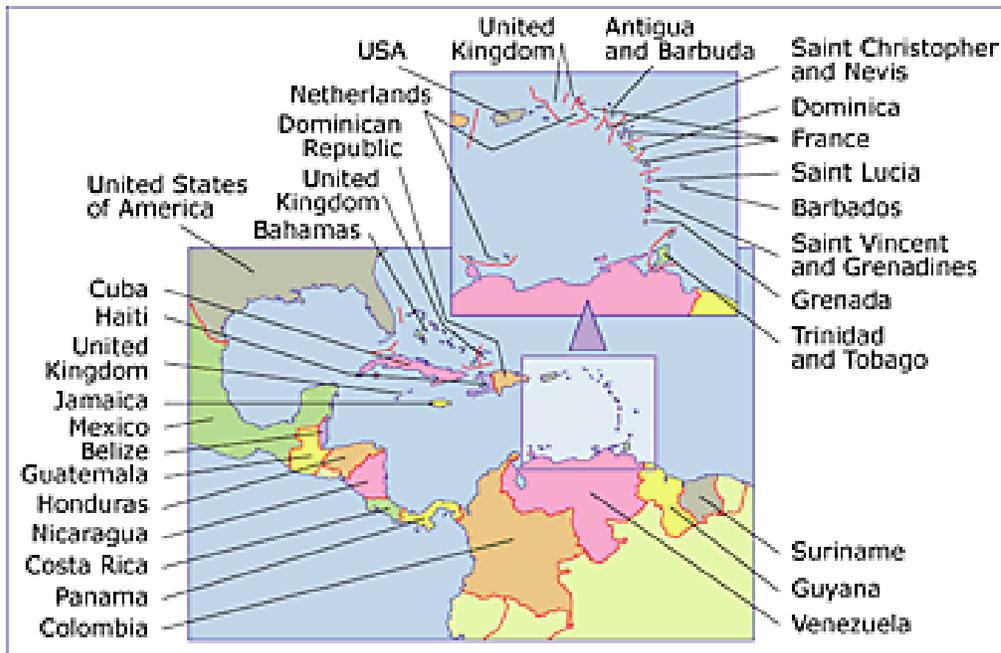
⁵ Ibid.

⁶ Editor interview with S. Keckes "Thin ice over Regional Seas," (1983) 12 *Ambio* 1, no pagination, <http://www.unep.ch/seas/Archive/thin.html> at July 15 2003.

⁷ Ivica Trumbic, "Regional Seas Programme of UNEP" United Nations Environment Programme—Mediterranean Action Plan, Priority Actions Programme Regional Activity Centre.

<http://www.unep.ch/seas/Archive/thin.html> at July 12 2003 (hereinafter "Trumbic") no pagination. References to section headings, s. 4.

The two most successful⁸ of the thirteen conventions are the Barcelona Convention, dealing with the Mediterranean Sea and the Cartagena Convention, dealing with the Caribbean.⁹ The later convention was finalized at the RSP meeting in Cartagena de Indias, Columbia in 1983. Although its proper title is, *Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region*, it is commonly known as the Cartagena Convention (hereinafter “Cartagena”).



⁸ Trumbic, s. 4 and s. 6. Success here appears to mean one or both of: countries cooperating and having a significant positive effect on the environment. As Trumbic notes: “The results and achievements have been mixed, and a thorough evaluation of its success still remains to be done.” Jorge Illueca, current director of UNEP Division of Environmental Conventions appears more optimistic. He wrote: “These regional agreements have been extraordinarily effective in engaging governments in protecting the environment.” in J.Illueca, “A Regional Seas renaissance.” (1999) 1 *Synergies* 2
<http://www.unep.ch/conventions/synergies/synergiesmag.htm> at July 12, 2003. Von Moltke observes: “The Regional Seas Programme has put in place a series of agreements to protect marine resources. None of these agreements has been effective in the sense that the trend of increasing pollution of the marine environment... has been reversed.” K. von Moltke, “Why UNEP Matters” *Green Globe Yearbook* (1996) p. 58. Interestingly, legal scholar E. Brown Weiss notes the near total lack of investigation on the efficacy of international legal agreements in terms of implementation and compliance. “Symposium: International Environmental Law: Contemporary Issues and the Emergence of a New World Order” (March 1993) 81 *Geo. LJ* 695-697.

⁹ Trumbic, s. 4.

(Source: Global Marine Oil Pollution Gateway website)

2. CARTAGENA CONVENTION: AN ANALYSIS

Cartagena along with its three protocols, dealing with oil spills,¹⁰ protected areas,¹¹ and land based pollution,¹² respectively, is one of the most comprehensive RSPs. In addition as of February 2, 2002 Cartagena was also coordinated with the Intergovernmental Oceanographic Commission for the Caribbean of UNESCO by way of a Memorandum of Cooperation.¹³ Cartagena is not a stand alone agreement or designed to supersede extent agreements. Partly it is designed to supplement other multilateral treaties in place such as MARPOL 73/78 and the Convention on Biological Diversity and to complement UNCLOS.

Cartagena is made up of thirty articles dealing with general objectives and responsibilities and a separate Annex of ten articles dealing with dispute resolution. The preamble indicates the parties' recognition of their responsibilities for the region's important and valuable marine environment, and their need to coordinate their efforts in order to preserve the environment in the development process. The parties specifically identify the need to secure wider acceptance of environmental agreements already in place and note that there are gaps in those agreements that need to be addressed. Cartagena is

¹⁰ A Protocol Concerning Co-operation in Combating Oil Spills (CEPPOL) in the Wider Caribbean Region, March 24, 1983. entered into force simultaneously with the Convention on 11 October 1986 <http://www.cep.unep.org/law/cartstatus.html> at July 2, 2003.

¹¹ A Protocol Concerning Specially Protected Areas and Wildlife (SPA) in the Wider Caribbean Region January 18, 2000 entered into force on June 18, 2000. <http://www.cep.unep.org/law/cartstatus.html> at July 2, 2003.

¹² A Protocol on Marine Pollution from Land-Based Sources and Activities (LBSMP) October 6, 1999 in Aruba. Has not yet entered into force <http://www.cep.unep.org/law/cartstatus.html> at July 2, 2003.

¹³ An Overview of Cartagena Convention, <http://www.unep.ch/seas/main/hoverv.html> at July 2, 2003.

focused on those waters making up the Caribbean Sea, the Gulf of Mexico and extends to the limits of the EEZ of the parties.

Article 1 identifies the area to be addressed—“the wider Caribbean region” (hereinafter WCR)—and notes that the area does not include internal waters of the countries. Article 2 deals with definitions. It identifies the WCR as including the Gulf of Mexico, the Caribbean Sea, and those adjacent areas of the Atlantic Ocean, south of 30 degrees latitude north and within 200 nautical miles of the Atlantic coasts of signatories to Cartagena.

Article 3, entitled “General Provisions”, sets out the terms governing relationships between Cartagena and other obligations taken on by the parties. Specifically, it notes that Cartagena shall not be deemed to modify any of those obligations, nor prejudice claims concerning matters of maritime jurisdiction. It anticipates and encourages further conventions to protect the environment.

Article 4 sets out the general obligations pursuant to Cartagena of the signatories. They are to:

individually or jointly, take all appropriate measures in conformity with international law... to prevent, reduce and control pollution of the Convention area... to ensure sound environmental management, using... best practicable means at their disposal and in accordance with their capabilities.

In fulfilling these objectives, they are not to damage the marine environment outside of the WCR. The parties are obligated to cooperate in implementing Cartagena and in assisting one another in the fulfillment of their duties.

Cartagena then addresses more specific issues. Article 5 requires the parties to:

take all appropriate measures to prevent, reduce and control pollution of the Convention area caused by discharges from ships, and for this purpose, to ensure the effective implementation of the applicable international rules and standards established by the competent international organization.

Articles 6, 7, 8, and 9 reiterate the language of Article 5 with respect to dumping, land-based sources of marine pollution, sea-bed activities, and airborne pollution respectively.

Article 10, which deals with specially protected areas, is forward looking both in anticipating further conventions or protocols to establish protected areas, and in its precautionary principle¹⁴ and “ecosystem” approach.¹⁵ It requires “all appropriate measures to protect and preserve rare or fragile ecosystems, as well as the habitat of depleted, threatened or endangered species.”

Article 11 sets out some specific duties. In the event of an emergency, all parties requested are required to respond to the emergency, regardless of cause. It requires the parties individually and jointly to prepare “contingency plans.” Further, it requires the parties to notify other states likely to be affected by pollution whenever the notifying party becomes aware of either pollution or a threat of pollution. Finally, it requires parties to inform each other and appropriate international bodies of remedial action taken.

¹⁴ Weiss Brown, above n 7, 690.

Article 12 requires parties to develop technical standards and the corollary legislation to protect the environment in “major development projects.” It requires the parties to a major development to consult with RSP and through it, with other parties affected by the major development. This cooperation requirement is interesting in that the development could be on land, and could be seen by some parties as an infringement of sovereignty.

Article 13 extends the cooperation, in non-mandatory language, to sharing scientific information relating to Cartagena and the WCR. It also calls for coordinating joint research projects and the linking of research centers, and in mandatory language, for participating in international arrangements for research and monitoring. Article 14 requires the parties to cooperate in the development of law to address liability and compensation in the event of pollution damage.

Article 15 deals with the development of institutions to administer Cartagena while designating UNEP as the secretariat for Cartagena. Article 16 sets out a scheme of bi-annual meetings with contingency meetings to be called as necessary, and what is to be addressed at those meetings.

Article 17 addresses additional protocols, and Article 18 deals with Amendments to Cartagena and its protocols. It is an open procedure permitting any party to propose amendments and sets out the procedure in general terms. Annexes and their amendments are dealt with in Article 19, the terms of which are essentially the same as those for Amendments to Cartagena and protocols set out in the previous article. Article 20

¹⁵ Ibid, 690.

addresses further procedural matters and sets out the parties' responsibility to identify their individual, specific financial responsibilities under Cartagena.

Article 21 permits other regional economic bodies to vote on behalf of all parties where those parties do not vote, in specific areas of competence. Article 22 provides the specifics of how and when the information required to be transferred pursuant to Cartagena be done—at the times and in the manner as the parties determine. Essentially, it draws attention to the need to formalize the information transfer.

Article 23 deals with dispute settlement concerning issues of interpretation of Cartagena. It specifically and repeatedly requires the parties to use “peaceful means” to resolve disputes, and permits any party unilaterally to submit the dispute for arbitration (pursuant to the terms of the Arbitration Annex to Cartagena).

Article 24 prohibits parties from becoming signatories to Cartagena unless they too become signatories to the Protocol. This provision seems to address the weakness of previous international agreements, which while committing parties to the agreement, fail to place immediate, positive duties to act.¹⁶

Articles 25, 26, 27, 28, 29 and 30 deal with the technical mechanisms of signatures, ratification, accession, entry into force, denunciation, and depositary respectively.

Cartagena was opened for signature on March 21, 1983 in Cartagena de Indias,

Columbia. The Columbian government is the depository. It permits non-signatories to become parties to Cartagena on approval of at least three-fourths of the parties. It further permits non-state parties to be members, and in particular, regional economic organizations to become members provided they meet certain conditions. Cartagena and the Protocol on Oil Spills was to come into force thirty days after the ninth instrument of ratification, acceptance or approval had been deposited. This criterion for coming into force is to apply to all subsequent protocols. Denunciation is permitted only after a period of two years of coming into force to be effective ninety days after the denunciation. Denunciation of Cartagena is deemed to extend to the protocols as well, and denunciation of a protocol is deemed denunciation of Cartagena.

In summary, the main duties created by Cartagena with respect to pollution are: pollution from ships (Art. 5), dumping (Art. 6), land-based pollution of the marine environment (Art. 7), sea-bed exploitation (Art. 8), and air-borne pollution (Art. 9). In addition, it creates obligations concerning the development of specially protected areas (Art. 10), the development of contingency plans (Art. 11), the development of technical standards and a consultative process for major developments (Art. 12), sharing of scientific information (Art. 13), development of appropriate laws and the coordination of law (Art. 14), and institutional development (Art. 15).

¹⁶ Weiss Brown notes all the Regional Seas Agreements have included this feature as a lesson from previous international agreements. The failure of the efficacy of previous agreements is attributable, in part, to the failure to include such provisions. Above n 7, 688.

3. COMPARISON WITH OTHER INTERNATIONAL CONVENTIONS AND REGIONAL SEAS AGREEMENTS

As one of a number of international agreements dealing with this issue, it is worth considering how Cartagena stands in comparison with these other agreements, both from an analytical perspective, and from a practical perspective. The value of such a comparison is that it provides an external hermeneutical tool for understanding Cartagena. In particular, many of the signatories to Cartagena,¹⁷ are also signatories to such international agreements as MARPOL 73/78 and UNCLOS.¹⁸ In this section, attention will be turned to examine the interaction between Cartagena and MARPOL 73/78.

MARPOL 73/78

¹⁷ As noted by various scholars, the USA has followed its own scheme making coordination with international frameworks difficult. See for example, comments on the Oil Pollution Act, 1990 and comments by M. White, "Development of the International Conventions" sec. 3.3.6, Ch. 3 in *Marine Pollution Laws of the Australian Region*, (1994). In addition, its environmental law system tends to be inward focused. USA monitors and regulates its own activities affecting the Gulf of Mexico, as is evident from the EPA's website on the area, <<http://www.epa.gov/region6/water/ecopro/index.htm>> at June 28 2003, and appears to have little cooperation with international agencies such as CEP. Its National Ocean Service notes various international projects, but none are focused on pollution in the Gulf of Mexico generally. For that reason, the following analysis will not deal with the USA. The National Environmental Protection Act mandates cooperation on an international level where it furthers US interests. Title 42, Chap. 55 Sec. 4332.

¹⁸ The 1982 UN Law of the Sea (UNCLOS) sets as its objective to create: "a legal order for the seas and oceans which will facilitate... equitable and efficient utilization... [and] the conservation of their living resources, and the study, protection and preservation of the marine environment." (preamble) UNCLOS was a significant step in a different direction with respect to environmental law pertaining the global commons for the world. In particular, UNCLOS precludes the view of the oceans and seas as an open dumping grounds for anyone choosing to do so. Further, it shifted the balance between the competing navigational interests of flag states and the environmental interests of coastal states. Finally, it took a proactive approach to the prevention of marine environmental pollution instead of an after the fact apportionment of liability approach. P.W. Birnie and A.E. Boyle, *International Law and the Environment*, 2nd ed (2002). (in course materials page numbers cut off.) UNCLOS does not, however, set out specifics of how these obligations are to be fulfilled, administered or enforced. Those aspects are left to the parties as they negotiate various conventions, protocols and other instruments to address those specific concerns. Therefore an analysis of UNCLOS is not particularly relevant and a review of the specific instruments, Cartagena and MARPOL 73/78 is appropriate.

MARPOL 73/78 was initially negotiated in London in 1973 as a successor to OILPOL. Due to problems with non-ratification of MARPOL 73, it was revised by a second meeting in London in 1978—MARPOL 78—in which sufficient modifications were negotiated to obtain the required ratifications needed to come into force.¹⁹ MARPOL 73 consists of its preamble and twenty articles and one convention. The preamble acknowledges the importance of the environment for human survival and the negative impact of oil on the environment. It sets out the interesting lofty objective of “Desiring to achieve the complete elimination of intentional pollution of the marine environment by oil and other harmful substances and the minimization of accidental discharge of such substances.”²⁰ The parties state their belief that this objective can best be achieved by rules addressing all pollution and not just oil.

MARPOL works on the basis of certifying ships in terms of safety, and pollution compliance. It further grants inspection powers, detainment and prosecution powers to both flag states, port states and coastal states. Article one sets out the parties’ commitment to be bound by the agreement, its protocol and annexes. Article two, which offers definitions is important for its definitions of substances, discharges and ships. Its broad definitions of “harmful substance,” which includes anything that harms marine life or damage to amenities, and “discharge”, which is defined as “any release howsoever caused... and includes any escape, disposal, spilling, leaking, pumping, emitting or emptying” are considerably limited by exclusions under 3(b)(i) of dumping under the

¹⁹ IMO website, conventions, MARPOL 73/78 <<http://www.imo.org/home.asp>> at July 3 2003.

²⁰ MARPOL 73/78 preamble.

dumping convention, and (ii) of sea-bed mineral resource exploitation.²¹ “Ships” include any type of human made thing for use on, in or underwater, fixed or free. There is no limit to the size of the thing that MARPOL 73 is to apply.

Article three states MARPOL 73 is to apply to all vessels flying the flag of a party or operating under the authority of a party. It specifies that MARPOL 73 is not designed to derogate from sovereign rights for exploration or exploitation of resources, and excludes all state ships in non-commercial governmental service.

Article four deals states that violations may be dealt with either under the law of the offended Party to MARPOL 73, or may be brought by the Administration of the ship.

Article five begins with MARPOL 73’s certificates regime. It requires all ships under the administration of a Party to have a certificate declaring the state of the ship. Parties are permitted to inspect ships for the purpose of determining whether the certificate is aboard, and in the event that there is considerable discrepancy between the certificate and the condition of the vessel, Parties are permitted to detain vessels until repaired, or authorize their departure only to sail to the nearest appropriate repair yard. MARPOL 73 also permits a party to deny entry to a vessel of another signatory for such breaches; however, in such instances diplomatic notification must be given immediately.

Article six sets out the responsibilities of cooperation among the parties. They are to be using “all appropriate measures of detection and environmental monitoring, adequate

²¹ 3(b)(iii) also excludes discharges for scientific purposes, which do not appear to be significant as they do not appear to be used as a pretext for dumping.

procedures for reporting and accumulation of evidence.” It furthers the inspection rights of parties to inspection for purposes determining whether ships have discharged in violation. In the event of such a discharge, the investigating party is required to forward the evidence to the administrator which in turn is obligated to take proceedings, provided the evidence is sufficient. It further permits one party to investigate a ship on the request of a second party.

Article seven addresses the reasonable commercial concern that ships shall not be “unduly detained or delayed” and that in the event of such detention or delay, compensation shall be paid “for any loss or damage suffered.” Article eight addresses the need for communicating information by mandating that the parties set up an office or agency to deal with matters of MARPOL 73 and inform the IMO and other parties about the office or agency.

Article nine deals with the interaction of MARPOL 73 with other conventions and specifically that it does not affect legal positions parties may take under UNCLOS, nor jurisdictional rights of coastal or flag states pursuant to international law. Article ten addresses dispute settlement by requiring parties to submit such disputes to arbitration pursuant to Protocol II to MARPOL 73. Article eleven requires the parties to communicate legislation dealing with MARPOL, NGO’s dealing with MARPOL 73 related matters, and samples of certificates, a list and details of reception facilities, reports which provide evidence of the application of MARPOL 73, and annual statistical reports to the IMO.

Article twelve requires parties to investigate casualties to ships where the casualty has resulted in a “major deleterious effect upon the marine environment” and to report it to the IMO. Article thirteen deals with the signatory and ratification process. Article fourteen addresses the annexes. Annexes I and II dealing with oil and noxious liquid substances were mandatory at the time of signing. The additional annexes, III, IV, and V dealing respectively with harmful packaged substances, sewage and garbage, are optional.

Articles 15, 16, 17, 18, 19 and 20 deal with entry into force provisions, amending procedures, technical cooperation, denunciation confirming the IMO as the depository and finally, and languages and official translations, respectively. MARPOL 78 Article one delays the coming into force of Annex II for three years. The second article restricts and places identification responsibilities for the NGO’s involved. These are the two substantive changes MARPOL 78 adds to MARPOL 73.

4. ANALYTICAL COMPARISON

Cartagena and MARPOL, while ostensibly dealing with the same matter, marine environmental pollution, are very different treaties. Aside from the obvious difference in scope as between a regional and an international agreement, and the focus of a general environmental treaty versus a treaty focused on ship source pollution, the treaties differ substantially with respect to their design, structure, implementation frameworks and

objectives. Those particular differences and consequential efficacy will be examined in this section.

Cartagena is a very broadly drafted treaty, reflecting an effort to include as many actual and potential environmental concerns as possible. This approach permits the details to be negotiated separately in protocols and annexes. Doing so allows the parties to get a basic framework into place more easily and start on the process of moving toward the objective with less obstacles.

By way of contrast, MARPOL is very specific. Whereas Cartagena offers the general obligation of “all appropriate measures, . . . to prevent, reduce and control pollution”, MARPOL 73/78 in its definitions identifies the issues to be addressed—“discharges” of “harmful substances.”²² Further, MARPOL grants more specific rights directly to parties in terms of inspections and enforcement than does Cartagena. Of course, Cartagena goes well beyond ships and so clearly such rights which could over-ride sovereignty claims could not be granted easily.

In terms of structure, in addition to the specifics noted in the detailed analysis above it can be noted that the overall structure of MARPOL 73/78 is focused on ocean activities. By way of contrast, Cartagena is structured with a focus on member rights and obligations. MARPOL 73/78 is deposited and monitored by a strong, well recognized, international body, the IMO. Cartagena is administered by a relatively young, smaller, poorly funded local office of UNEP located in Kingston, Jamaica.

Specifically focusing on Cartagena's ship source marine pollution provisions, it may be characterized as exceedingly general. Again, the language is

shall take all appropriate measures to prevent, reduce and control pollution of the Convention area caused by discharges from ships and, for this purpose, to ensure the effective implementation to the applicable international rules and standards established by the competent international organization.²³

There are at least three ways to interpret this Article. It could be read as referring to parties' obligation to ensure compliance with international agreements concerning ship-sourced pollution. Or, it could be read as indicating an obligation to create agreements concerning ship-based pollution which are in conformity with international law, or it could be read as reaffirming an obligation for the parties themselves to comply with obligations placed on them by international law.

By way of contrast, MARPOL 73/78 includes in its Protocol a series of specific regulations detailing not only the size and types of ships it applies to, but also the permitted amounts of discharges and the specific duties placed on parties and mariners and others in the event of discharges. One result of such specificity is that MARPOL '73/78's successes and failures are more easily measured.

Although in one sense, it may not be fair, let alone feasible to make a comparison between the agreements, given their different focuses and scopes; in the areas in which

²² See Appendix B.

²³ Art. 5

they overlap, there is some, if not sufficient, basis for comparison. This comparison should provide not only some idea of the efficacy of various approaches, but also the efficacy of international instruments of environmental law, at least in the Caribbean region.

5. “ON THE GROUND” RESULTS ANALYSIS

5.1 MARPOL: SUCCESS?

MARPOL 73/78 is generally considered a great success. The oil industry points to the reduced tanker discharges. Indeed, there has been success in terms of reducing oil tanker disasters. As observed by INTERTANKO, the oil tanker owners group, “The average number of large spills per year during the 1990s was about a third of that witnessed during the 1970’s.”²⁴ These figures, though comforting they may be, leave room for question on MARPOL success in other areas.

In Gerard Peet’s effort to evaluate the success or failure of MARPOL 73/78 he observes that there are two criteria in determining success—a reduction of the total amount of oil entering the marine environment from accident or operation of ships, and second, determining whether national governments have effectively implemented international agreements.²⁵ The basis for answering the first question is monitoring statistics. As Peet observes, however, “[there are] only a few areas in the world where adequate efforts are

²⁴ ITOPF, “Historical Data” Statistics, at p. 2, <http://www.itopf.com/stats.html>, at July 5, 2003.

made to detect... discharges.”²⁶ Its lack of monitoring state compliance and its lack of mechanism for dealing with non-complying states.²⁷

He notes, for example, that according to GESAMP statistics, the North Sea appears to have a very high level of discharges, but then notes than extensive Dutch efforts to monitor oil in the North Sea.²⁸ By way of contrast, from the reported statistics, one would believe there is hardly any oil being discharged into the seas south of the equator. He offers: “It is more likely that the numbers of detected discharges are an indication of the effort made to detect discharges”²⁹ than a reflection of actual discharges. Peet finds that within a single publication, GESAMP’s 1993 report, that two significantly different estimates of oil entering the marine environment are offered. The one estimate is 2.3 million tons, the other is 7.3 million tons. From this he concludes “The various estimates are too far apart.... The only valid conclusion seems to be that we do not really know how much oil enters the marine environment, due to a lack of reliable data.”³⁰

A failure to declare MARPOL 73/78 a success in reducing oil entering into the marine environment, however, is not a declaration that it has failed to have a positive impact in reducing ship based discharges.

The second measurable determinant of MARPOL 73/78 success, national compliance with international obligations, does not seem to fare much better. To arrive at this

²⁵ G. Peet “International Co-operation to Prevent Oil Spills at Sea: Not Quite the Success It should Be.” In H. Ole and G. Parmann (eds) *Green Globe Yearbook of International Co-operation on Environment and Development* (1994) p 41-54.

²⁶ Ibid. p. 44.

²⁷ Birnie above n. 14.

²⁸ Ibid, p. 44.

²⁹ Ibid.

conclusion, Peet examines ratifying countries' compliance with MARPOL 73/78's clauses requiring measurable action. These are: Art. 11(e) and (f) the reporting requirements, Art 6(1) use of all appropriate measures to detect, Art 4(1), (2), (3), and (4) mandatory enforcement measures, and Annex I, Reg. 12(1) concerning port reception facilities. We will turn briefly to analyze country compliance with the obligations contained in each of these articles.

With respect to Art.11's reporting requirements, Peet observes that only the Australians have submitted every annual report as required by the convention, and that another seven have submitted all but one. He goes on to note, however, that thirty countries party to MARPOL 73/78 have never submitted a single report.³¹ It is hard to imagine, says Peet, how a country that fails such a relatively simple administrative task is directing attention to the more difficult task of fulfilling other obligations under the convention.³²

Article 6(1) deals with detection and monitoring duties. In the previously mentioned study, when The Netherlands devoted additional resources to detection, significantly more discharges were detected creating an impression that the North Sea was exception in the amount of oil and waste being discharged into the ocean. Given these obviously skewed discharge statistics, showing high levels when monitoring detection measures are being implemented it can hardly be argued that countries are fulfilling their MARPOL 73/78 obligations.³³

³⁰ Ibid, 43.

³¹ Ibid.

³² Ibid, 47.

³³ Ibid, 48.

As to the efficacy of the prosecutions mandated pursuant to Article 4, the situation is even more dismal. After his examination and analysis of detection, detentions and prosecutions, Peet concludes in agreement with the conclusion of another study by the Werkgroep Noordzee:³⁴

There was little chance that ships would be detected... [and if detected] little chance that they would be brought to justice... [and if convicted] chances were small penalties would be given... [and if given would] definitely not [be] adequate in severity to discourage MARPOL 73/78 violations.³⁵

Finally, as to the obligation to provide port reception facilities created by Annex I, Reg. 12, there seems to be a very low level of compliance. A 1986 study found the lack of port reception facilities to be a serious complaint by shipmasters hampering their ability to comply with MARPOL 73/78 requirements³⁶ and as noted in their 2002 work, Birnie and Boyle write: “the persistence of operational discharges does indicate a continuing inadequacy in the provision of port reception facilities, a long-standing problem despite the obligation to provide them placed on port states by the MARPOL Convention.”³⁷

Turning our focus back to the WCR sheds further light on MARPOL 73/78’s success. MARPOL 73/78 in the WCR does not seem to have reached even a basic level of success. In his 1996 study of the state of marine law in the Caribbean region, Prof. Anderson observes, that a strict application of even MARPOL 73/78’s predecessor,

³⁴ (Trans. “North Sea Workgroup”) M. J. Stoop *Olieverontreiniging door schepen op de Noordzee over de periode 1982-1987, opsporing en vervoging*, cited in Peet, above n 21, 54, n 10. In other words, from a shipmaster’s perspective there appears to be minimal legal incentive to comply with MARPOL 73/78. Such compliance would be more as a result of the shipmaster’s own convictions on matters concerning the marine environment than legal duties.

³⁵ Above n 21, 50.

³⁶ *Ibid* 50-51.

OILPOL, would reduce oil annual discharges from 1,000,000 tons to 16,700 tons.³⁸

Unfortunately, it is simply not being done.

Although pursuant to MARPOL 73/78, the Caribbean was declared an Annex V (protection from pollution from garbage) special area, the important Annex I (protection from oil pollution) Special Area designation has not been put into place. The issue is the previously mentioned costly reception facilities.³⁹ This state of affairs—the failure to protect from garbage and oil pollution-- is particularly lamentable given on the one hand, the region’s great biological diversity, beauty and the important economic boost from the tourism industry dependent on that beauty, and on the other hand, the region’s significant oil reserves, production and transportation.

Perhaps the only correct conclusion is that of Birnie and Boyle who observed:

“Quantifying MARPOL’s impact is... not straightforward, and the data do not point to any clear conclusion, except that the operational pollution does appear to have declined.”⁴⁰

5.2 CARTAGENA CONVENTION: SUCCESS?

Cartagena’s objectives vis-à-vis pollution are the control and reduction of: pollution from ships (Art. 5), dumping (Art. 6), land-based pollution of the marine environment (Art. 7), pollution from sea-bed exploitation (Art. 8), and air-borne pollution (Art. 9). In addition,

³⁷ Ibid.

³⁸ W. Anderson, *The Law of Caribbean Marine Pollution*, (1996) 67, n. 104.

³⁹ Ibid, 138.

it creates obligations concerning the development of specially protected areas (Art. 10), the development of contingency plans (Art. 11), the development of technical standards and a consultative process for major developments (Art. 12), sharing of scientific information (Art. 13), development of appropriate laws and the coordination of law (Art. 14), and institutional development (Art. 15).

We will analyse these Cartagena goals making reference as well to the three protocols. Article 5, dealing with pollution from ships is complementary to MARPOL 73/78 and relates to discharges of harmful substances. Ships release harmful substances by operation and by accident. In terms of pollution from operation, they produce harmful substances in the course of making their journeys. These harmful substances are waste oil, air pollution, and garbage and sewage.⁴¹ To avoid the discharge of these harmful substances at sea, they must discharge them at ports in port reception facilities. The issue then becomes one of port reception facilities.⁴²

Port reception facilities in the WCR are either non-existent or inadequate at best. An IMO/World Bank study found that of 23 site visits to port reception facilities in the WCR, 10 ports did not permit off-loading of solid wastes and that the 13 that permitted off-loading did not have sufficient facilities to deal with the waste.⁴³ This lack of port

⁴⁰ Ibid.

⁴¹ Birnie above n 14.

⁴² This is after one considers such issues as the master's desire not to pollute and surveillance and enforcement measures as previously discussed.

⁴³ Environmental Resources Limited, "Port Reception and Disposal Facilities from Garbage in the Wider Caribbean." (1991). IMO/World Bank, 287. cited in "Oil and Litter" Global Plan of Action for the Protection of the Marine Environment from Land-based Activities <http://www.cep.unep.org/gpa/oilitter.htm>, at July 5, 2003.

reception facilities is noted as a cause of oil pollution in the WCR.⁴⁴ Further, cruise ships which generate about 4,400 kg of waste per day,⁴⁵ place an additional demand for port reception facilities and are known to dump untreated sewage and hazardous waste directly into the marine environment of the WCR.⁴⁶ In addition to increased cruise ship activity, the Caribbean is increasingly becoming an important area for containerized shipping.⁴⁷ This development places further demands on the environment from shipping activities, particularly in light of the inadequate port reception facilities.⁴⁸

Comprehensive spill statistics for non-tankers are non-existent in the WCR. There is a serious lack of information about oil contamination by ships in the WCR.⁴⁹ Given the lack of monitoring,⁵⁰ one may conclude that oil discharges by ships are not being tracked, addressed or discouraged through legal proceedings and accordingly, it is a foregone

⁴⁴ Caribbean Environment Programme, United Nations Environment Programme, CEP Technical Report No. 33 "Regional Overview of Land-Based Sources of Pollution in the Wider Caribbean Region" (1994) <http://www.cep.unep.org/pubs/techreports/tr33en/index.html> at July 12 2003.

⁴⁵ GESAMP "A Sea of Troubles," Reports and Studies No. 70 at p. 28, <http://gesamp.imo.org/no70/index.htm> at July 15, 2003.

⁴⁶ Ibid, p. 24. GESAMP notes that about one third of the waste dumped by cruise ships in the Caribbean is done deliberately. In the recent past, Norwegian Cruise Lines, Carnival Corp. and Royal Caribbean Cruises all have faced fines ranging from \$1 million to \$27 million for illegal pollution of the marine environment. Further these companies have engaged in production of fraudulent documents to cover up their wrong-doing. In November, 2002 Norwegian was given the smallest fine of \$1 million because of its efforts to report, cooperate and change its operating procedures. M. Adams, "U.S. Keeps Wary Eye On Cruise Ships For More Pollution" Miami *USA TODAY* 11 August 2002.

<<http://www.usatoday.com/travel/news/2002/2002-11-08-cruise-dumping.htm>> at July 15, 2003. The court's decision, however, to accept Norwegian's position seems somewhat suspect when one considers Norwegian's May 2003 action. As the Seattle Times reported: "The 2,400-passenger Norwegian Cruise Line ship... dumped more than 16,000 gallons of human waste in the Strait of Juan de Fuca last weekend." C. Welch, "Dumping of ship's waste widens rift between state, Coast Guard" (Seattle) *Seattle Times* 8 May 2003 http://seattletimes.nwsourc.com/html/localnews/134699148_ship08m.html at 15 July 2003.

Holland America has also received a multi-million dollar fine for sewage discharge. Noted on Navy Shipyard Clearinghouse website <<http://navyseic.dt.navy.mil/oil/oil.htm>> 15 July 2003.

⁴⁷ See for example, CSX's new port facility being built in the Dominican Republic, noted below n 68.

⁴⁸ CEP Technical Report No. 33 above n 39, 7.

⁴⁹ GESAMP Statement 2001 <http://gesamp.imo.org/> at 10 July 2003.

⁵⁰ The Government of Mexico claims to be monitoring the situation, however, any details of such programs are not available. III Estudios y Actividades, sec. D The marine environmental program is run by the Mexican navy. <http://www.semar.gob.mx/promam.htm> at 21 July 2003.

conclusion that they occur with relative frequency. Such being the case, the determination of the actual amount of pollution entering the WCR marine environment as a result of shipping activities is impossible. Accordingly, it is not possible to make any statements, positive or negative, about the utility of Art.6 of the Cartagena in decreasing pollution by ships in the Caribbean. One can merely speculate that with the explosion in shipping and cruise ships in the WCR that the environmental situation is not improving.

Article 7, deals with land-based sources of pollution. A determination of Cartagena's utility in reducing land-based pollution can be done by an examination of two sources: the technical reports concerning contaminants entering the Caribbean, and by reference to a particular visible land-based use which places heavy demands on the marine environment—tourism.⁵¹

Land-based marine environmental pollution in the WCR has six main sources: sewage, oil hydrocarbons, sediments, nutrients, pesticides, solid waste and marine debris, and toxic substances.⁵² The two leading land-based pollutants of the marine environment—sewage and oil—will be briefly examined.

By 1993, sewage had been identified as by far the most significant pollutant.⁵³ As noted in the RSP report, "From the Regional overview, we conclude that the main problems

⁵¹ A legal review of duties under the protocol on land-based contaminants will not assist as it is not yet in force.

⁵² CEP Technical Report 33 above n 39. While sediments, nutrients, pesticides, solid wastes and toxic materials are also significant pollutants in the WCR, space precludes their discussion.

⁵³ Ibid 5.

affecting the Caribbean Sea are domestic sewage and solid waste.”⁵⁴ The WCR sewage problem is caused by the large number of people living along the coast, tourism, industry and ship wastes. Unfortunately, little information concerning sewage treatment along the non-USA coasts has been available.⁵⁵ A survey of sewage treatment plants in the WCR led to the conclusion that there are inadequate numbers of such plants and that approximately two thirds of those in operation were inadequately maintained to serve their function.⁵⁶ It has been estimated that no more than ten percent of the population in the WCR is served by sewage treatment.⁵⁷ Despite knowledge of the problem in the 1980s the situation appears no different in 2003.⁵⁸

The WCR is one of the world’s leading oil producing regions.⁵⁹ As a result, there are considerable associated activities, including, exploring, drilling, extracting, refining and transport that take place on land. These activities lead to spillage of oil and hydrocarbons into natural and human-made systems that empty into the marine environment. Oil refineries and petrochemical plants in the WCR have been identified as a major source of marine pollution⁶⁰ and the oil industry as the largest industrial polluter.⁶¹ Further, the

⁵⁴UNEP: Assessment of Land-based Sources and Activities Affecting the Marine, Coastal and Associated Freshwater Environment in the Wider Caribbean Region,” UNEP/GPA Co-ordination Office & Caribbean Environment Programme (1999) 20 (hereinafter UNEP Assessment) www.gpa.unep.org/documents/technical/rseas_reports/169-eng.pdf at 10 July 2003.

⁵⁵ CEP Technical Report 33 above n 39, 8 notes the “intense traffic of coastal cargo vessels and recreational boats in the WCR” and that they lack facilities to process their own wastes.

⁵⁶ Ibid 5.

⁵⁷ KCM, Inc, CEP Technical Report 40, “Appropriate Technology for Sewage Pollution Control in the Wider Caribbean Region,” (1998) 7. <http://www.cep.unep.org/pubs/techreports/tr40en/index.html> at 8 July 2003.

⁵⁸ UNEP GEO- 3 (Global Environmental Outlook) (2002) 18. <http://www-cger.nies.go.jp/geo/geo3/> at 18 July 2003.

⁵⁹ CEP Technical Report. 33 above n 39, 9 notes that the WCR provides approximately, 170×10^6 tons of oil per year.

⁶⁰ Ibid, 10.

⁶¹ UNEP GEO – 1 (1997), Box 2.3.

risk of spills and pollution is high.⁶² Despite this recognition, little has been done to determine the risks or prepare a response.⁶³ Even basic monitoring responsibilities, created under Cartagena's oil spill protocol of 1983, are not being fulfilled.⁶⁴

Article 8 of Cartagena deals with sea-bed exploitation. It can be assessed by examining how the WCR has dealt with its main sea-bed resource, oil. As observed above, WCR seems to have had little success in dealing with its oil pollution problems whether caused by the industry itself or by ship related activities.

Article 10 requires the parties to create specially protected areas. CEP's SPAW programme has made some progress in terms of establishing Specially Protected Areas.⁶⁵

⁶² UNEP Assessment "Oil pollution has been identified as an important environmental issue in the WCR and that due to the amount of oil tankers and frequency of navigation through out the region there is a big risk that accidents happen. It is of paramount importance that flexible oil contingency plans be drafted to deal with emergencies not only for crude oil but other harmful substances that can also be transported in the region", above n 49, 16.

⁶³ UNEP Assessment above n 49, 11. Noted also by C. Roach, UNDP Caribbean Regional Seminar On The Use Of Information Technology In Comprehensive Disaster Management "The Transport Dimension: A Maritime Safety System" Ocho Rios, Jamaica 29 - 31 May 2002 slide 15
<http://www.cdera.org/pdfs/meetings/itconf2002/1_Disaster%20Preparedness%20Maritime%20Transport_.pdf> at 18 July 2003.

⁶⁴ The protocol on oil spills, the oldest of the three protocols, which among other things requires monitoring and reporting of oil spills, may be of questionable value. In recent telephone interviews with officers of CEP's offices in Kingston, Jamaica and the IMO's representatives in Curacao, specifics of oil spills limited to the WCR for any period were not available. Telephone interviews conducted June 25 and 26, 2003. Coincidentally, Mr. Fion Molloy of ITOPF's London office is preparing a study on spills in excess of 5,000 tonnes in the Caribbean and has been kind enough to provide me with his statistics, which are attached as Appendix I. Unfortunately, as ITOPF notes, its information is limited to tankers, combined carriers and barges, and only to accidental spills and that 85% of spills are less than 7 tonnes. Given such statistics and the limitations, one cannot but help to wonder what value such information really is in an analysis of oil entering the Caribbean as a result of shipping. Furthermore, despite various estimates of amounts of oil entering the marine environment, such as those noted by S. Patin, "Environmental Impact of the Offshore Oil and Gas Industry" <<http://www.offshore-environment.com/oilpollution.html>> at June 30, 2003 relying on three different studies, the GESAMP acknowledges that it needs to determine a number of variables before it can issue any authoritative numbers concerning oil entering the marine environment. IMO/FAO/UNESCO-IOC/WMO/WHO/IAEA/UN/UNEP, Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) "Report Of The Thirtieth Session" Monaco, 22-26 May 2000, Reports and Studies No. 69, p. 5. <http://gesamp.imo.org/no69/index.htm> at 5 July 2003 (hereinafter UNEP Monaco)

Over one hundred protected areas have been established in the WCR.⁶⁶ Unfortunately, many of the areas have no management plans.⁶⁷ As noted in UNEP's technical report on the issue: "Institutions involved with protected areas are usually small, understaffed, and under-trained."⁶⁸ Many of the parks created under SPAW are no more than "paper parks."⁶⁹

Article 11 requires the development of contingency plans. This obligation was created in 1983. It has yet to occur.⁷⁰ Other Article 11 obligations may be faring better. One notes, for example, CEP's report that it has provided information and coordination assistance in some marine pollution incidents.⁷¹

Article 12 requires international consultation with respect to major development projects. Despite major real estate developments pursuant to Mexico's FONATUR⁷² and various major port developments,⁷³ no evidence of such consultations having occurred was uncovered in the course of researching this paper.

⁶⁵ The basis for this part of the discussion is M. Miller, "Protecting the Marine Environment of the Wider Caribbean Region: The Challenge of Institution-Building." *Green Globe Yearbook* (1996) 37.

⁶⁶ *Ibid.*, 41.

⁶⁷ *Ibid.*

⁶⁸ Caribbean Environment Programme, United Nations Environment Programme, CEP Technical Report 36 "Status of Protected Area Systems in the Wider Caribbean Region" (1997) 3.

⁶⁹ Miller, above n 60, 43.

⁷⁰ Roach, above n 58.

⁷¹ Noted on CEP website <http://www.cep.unep.org/search/map.html> at July 3, 2003.

⁷² Mexican government agency responsible for the development of major tourist destinations including Cancun, and Cozumel.

⁷³ A CSX container port being built on the Caucedo Peninsula, Dominican Republic is to be ready this year, 2003 http://www.tdctrade.com/shippers/vol25_2/vol25_2_seaports02.htm at 3 July 2003, another national port in Martinique for 2004, www.industriemartinique.com/industry.html and three more new ones reported in Panama <http://www.embassy-avenue.jp/panama/econo.htm> at 3 July 2003.

Article 13 requires sharing of scientific information. CEP's series of 43 technical reports goes some way in addressing this concern.⁷⁴ And a general review of internet search results indicates some cooperation among scientists and governments on environmental issues.⁷⁵ Article 14 requires the development of laws to address liability and compensation in the event of pollution damage. To date, this has not occurred. In her analysis of Cartagena's oil spills protocol, seven years ago Miller observed: "Even in a non-controversial areas such as the oil-spills Protocol, progress on implementation has been slow... few of them [countries] have implementing legislation."⁷⁶

Article 15 requires institutional development and integration. Such development and integration has not yet occurred to a significant extent.⁷⁷ As Miller observed, "oil spills response capability in the region is still very limited, and it is inhibited by legal and administrative problems."⁷⁸

⁷⁴ Studies available on CEP's website. <<http://www.cep.unep.org/pubs/techreports/techreports.html>> at 10 July 2003.

⁷⁵ A search on google.com.mx under cooperacion entre cientificos sobre ambiente marino returned 4,810 hits. Clearly, not all of these will be exactly on topic but it does demonstrate some cooperation on the issue of scientific cooperation on marine environmental matters.

⁷⁶ Miller above n 60, 41.

⁷⁷ Miller above n 60, 41. Note also the report of Timothy J. Kasten, Acting Deputy Coordinator, UNEP/Regional Coordinating Unit for the Caribbean Environment Programme, concerning the struggles of coordinating projects among parties dealing with CEP <http://www.gpa.unep.org/igr/Reports/WCR.htm> at 15 July 2003.

⁷⁸ Ibid., p. 42. Note that a number of private companies such as Spek of The Netherlands claim to have capabilities to have on the ground response worldwide in less than twenty four hours, so Miller's criticism may not have that much force, unless it is specifically directed to the lack of oil response ships stationed or available within the area to respond. As well, CEP's Assessment and Management of Environmental Pollution newsletter of June 1999 states that a number of Caribbean oil companies have stockpiles of response equipment ready for rapid deployment. <http://www.cep.unep.org/programmes/amep/update.html> at 12 July 2003.

In the overall, as to the actual condition of the environment, there is little evidence that the situation today is different than it was twenty years ago when Cartagena was first ratified.

6. WHAT'S THE PROBLEM?

Given the complexity of the political and economic situations and of pollution itself, there are a number of causes which can be identified as causing or contributing to the problem. The Global Action Plan meeting report identifies the following root causes: poverty, unsustainable consumption patterns, and poorly managed social and economic development.⁷⁹

The region addressed by Cartagena would be characterized as having all four of the root causes: poverty, unsustainable consumption patterns, and poorly managed social and economic development. Poverty, places a great number of competing demands on governments that themselves lack sufficient resources. Governments of developing countries are dealing with such basic concerns as potable water, sanitary sewers, basic education, and housing. Given these top priority items, it seems difficult to justify the expenditures required to address environmental concerns⁸⁰ such as expensive port reception facilities⁸¹ or sewage treatment plants.

⁷⁹ "Report Of The First Intergovernmental Review Meeting On The Implementation of The Global Programme Of Action For The Protection Of The Marine Environment From Land-Based Activities" Montreal, Canada, 26-30 November 2001 UNEP/GPA/IGR.1/9 (2001) 10.

⁸⁰ CEP Technical Report 40 above n 52, 18.

⁸¹ The costs of port reception facilities is one of the reasons given for their not being constructed in the WCR, Maritime Environment Committee of the IMO "The Lack Of Reception Facilities For Ship-

Sewage as the main pollution concern in the WCR, deserves priority in terms of funding.

Nevertheless, given the costs it is hardly surprising that sewage treatment is not

improving. As noted in UNEP's 2001 report concerning the WCR:

...serious and maybe expensive measures [to deal with sewage] should be taken promptly. At present only very few governments are negotiating projects on sewage management.⁸²

The generous figure is as previously mentioned, between 80% and 90% of all waste is discharged untreated into the near shore area of the Caribbean.⁸³

This sewage treatment issue is exacerbated by the tourism industry. Tourism is a very significant part of the economy of the WCR.⁸⁴ On an annualized basis, these tourists add some 700,000 tons of solid waste.⁸⁵ Furthermore, tourism is often developed in areas with insufficient municipal waste treatment facilities⁸⁶ which situation is exacerbated by cruise ship dumping.

Generated Waste In Many Ports" MEPC/Circ.309, 19 January 1995, T5/1.07 <http://www.uscg.mil/hq/g-m/nmc/imo/pdf/Circ0/Mepc1/309.pdf> at 2 July 2003.

⁸² UNEP Assessment above n 49, 16.

⁸³ UNEP Assessment above n 49, 11. SEE Lloyd Gardner, Ecotech Inc. Ltd, CEP Technical Report 38. "Coastal Tourism in the Wider Caribbean Region: Impacts and Best Management Practices" (1997) <http://www.cep.unep.org/pubs/techreports/tr38en/index.html> at 15 July 2003.

⁸⁴ It produced a very significant 25% of the GDP in 1996 it is expected to increase to 36% of the GDP by 2006. (UNEP: Assessment of Land-based Sources and Activities Affecting the Marine, Coastal and Associated Freshwater Environment in the Wider Caribbean Region," UNEP/GPA Co-ordination Office & Caribbean Environment Programme (1999), 8.) The region's 70 million inhabitants are increased annually by some 35 million tourists with an average stay of 10 days. (This estimate does not include entire countries, such as Mexico or Columbia, whose entire population is not on the Caribbean. It does include the complete population of island countries. Source: UNEP Assessment above n 49, 1.) An additional 13.4 million tourists arrive on cruise ships. UNEP Assessment above n 49, 4, The Caribbean hosts 50% of the world's cruising tours 8. This number is conservative given the radically different figures offered by GEO -3 "Tourism represents around 12 per cent of the GDP of the region, much of which is concentrated along the coasts. Some 100 million tourists visit the Caribbean each year and contribute 43 per cent of GDP and one third of export revenue." Above n 53, 18.

⁸⁵ UNEP Assessment above n 49, 11.

⁸⁶ CEP Technical Report 33, above n 39, 7.

Poverty further exacerbates the problem by limiting environmentally friendly alternatives for survival available to people suffering from poverty. Many poor people sustain themselves by unsustainable consumption practices which result in such things as deforestation, and fishery collapses.⁸⁷ Unsustainable consumption patterns are also manifest at the opposite end of the spectrum. USA's consumerist culture is universally recognized as very harmful to the environment. The impact on the WCR of USA lifestyle can be seen in the level of contaminants in Mississippi River discharges into the Gulf of Mexico⁸⁸ where in 1997 it created a 7,000 square mile dead zone in the Gulf of Mexico.⁸⁹

Financing also effects governmental ability to treat pollution from oil extraction, refining and transport. Financing problems inhibit a government's ability to monitor oil contamination by ships in its waters and accordingly, the number of discharges discovered is minimal. None of the Latin governments has appropriate funds for such monitoring.⁹⁰ Further, governments lack funds for the notoriously expensive port reception facilities.

⁸⁷ Noted, for example, by Brown Weiss, "states do not agree on priorities—whether to satisfy immediate needs to alleviate poverty and local environmental degradation or longer-term needs to protect the robustness and integrity of the biosphere." *Op cit* p. 710. And, as noted by Katz de Barrera-Hernandez and Lucas, "penalizing technically illegal activities undertaken for subsistence purposes, such as Wood-cutting and hunting is highly unpopular and may have little practical effect where no realistic alternatives to these practices are available.", p. 224.

⁸⁸ CEP Technical Report. 40 above n 52, various.

⁸⁹ Carol Kaesuk Yoon, "A Dead Zone Grows in the Gulf of Mexico" Jan, 20, 19998 NY Times, at F1.

⁹⁰ Noted by Birnie and Boyle, above n 19. The various agencies dealing with marine pollution note the lack of information, which may in part be a result of inadequate monitoring. Surveillance "the shortage of information on marine environmental conditions and trends is a serious matter which, in the opinion of GESAMP outweighs in importance many of the issues currently being addressed by those responsible for marine environmental protection"

On GESAMP Statement of 1998: Surveillance And Assessment Of Marine Environmental Conditions http://gesamp.imo.org/surv_ass.htm at 12 July 2003. As noted by UNEP "Oil and gas extraction, processing, storing and transporting have caused major pollution problems in the region. There is however

Financing problems extend to the RSP administration itself, which as part of UNEP, has suffered from severe funding constraints. RSP noted in its 2001 report:

“The available biennial budget for the regional seas programmes had declined drastically from a level of some \$10 million to \$12 million during the first half of the 1990s, to a current level less than \$3 million.”⁹¹

The WCR’s pollution problem also stems from failed efforts to manage economic development. In particular, the need for foreign currency, brought in by industry, oil and tourism create an overwhelming pressure to relax or ignore competing environmental claims.⁹²

Environmental law in Latin America is in considerable transition and reform.⁹³

Currently, much environmental law is scattered through other pieces of legislation, and developed on outmoded command-and-control models.⁹⁴ Legislative efforts have not been effectively coordinated and there are innumerable conflict of laws issues as new legislation is laid over top of existing legislation.⁹⁵ These problems combine to leave many legislative gaps in terms of dealing with environmental problems.⁹⁶

not much up-dated data on the status of oil pollution in the [WCR] region.” UNEP Assessment above n 49, 13, exceptions noted for Havana Bay, the USA’s regions, Bluefields in Nicaragua and Puerto Limon in Costa Rica.

⁹¹ UNEP Monaco above n 59, 6

⁹² “In practice, priority has been given to the structural adjustment programs with a view to increase the generation of foreign currency... and to attend to the service of the external debt in the shortest period of time possible. The search for more international competitiveness, efficiency, and productivity has... [been] harmful for the environment.” Noted in “Rio+5 Synthesis Report of Latin America Consultations,” San José, Costa Rica, (February 26, 1997) 2

<http://www.ncsdnetwork.org/americas/reports/rio5/regional/amlateng.htm> at 12 July 2003.

⁹³ L. Katz de Barrera-Hernandez and A. Lucas, “Environmental Law in Latin America and the Caribbean: Overview and Assessment,” 12 *Geo. Int’l Envtl. L. R.*, 207-245, p. 210.

⁹⁴ *Op cit.*

⁹⁵ *Op cit.*, p. 212.

⁹⁶ *Op cit.*, 214.

Finally, at an institutional level there are considerable problems. The international corruption watchdog, Transparency International, places all of the Latin countries signatory to Cartagena among the bottom 50% corrupt countries.⁹⁷ This failure, when combined with the complex nature of the political situation—the WCR is made up of 36 states and territories with widely varying economies, levels of development, populations, and access to resources—exacerbates the problems of coordination. The governments themselves are weak and poorly organized.⁹⁸ Finally, many writers and reports note the lack of political will to deal with the issues.⁹⁹

7. MEXICO: A COUNTRY SPECIFIC CASE STUDY OF THE CARTAGENA CONVENTION

In many ways Mexico is typical of Latin American countries, including most of the countries that have ratified Cartagena and may be therefore a good indicator of how things transpire in the other countries that have ratified Cartagena. Mexico is the second

⁹⁷ Beginning with Colombia and Mexico tied at 57th of 102 with a score of 3.7 and 3.6 out of 10 respectively, all the other Latin countries receive lower rankings. The notable exception is Costa Rica which scored 4.5. The Netherlands, UK, USA, France received scores 9.0, 8.7, 7.7, 6.3 respectively and the non-Latin countries, Trinidad & Tobago, and Jamaica, received 4.9 and 4.0—still not a very respectable score. Transparency International, “Transparency International Corruption Perceptions Index 2002,” Table 2, <http://www.transparency.org/cpi/2002/cpi2002.en.html> at 12 July 2003.

⁹⁸ As noted in GEO-3 on the Latin American region: Noted in GEO – 3 “institutional and organizational weaknesses in the countries of the region, and the myriad authorities responsible for marine and coastal management, make the implementation of policies a difficult task.” Above n 53, 18. Further, these governments with limited resources (noted in UNEP Nov. 2001, 18), are more susceptible to what Weiss Brown refers to as “treaty congestion.” Weiss Brown 697-702.

⁹⁹ For example, GESAMP Reports and Studies No. 66, Annex X GESAMP Statement Of 1998 Concerning Marine Pollution Problems <http://gesamp.imo.org/ocean.htm> at 21 July 2003, UNEP, G. Palmer, “New Ways to Make International Environmental Law” (1992) 86 A.J.I.L. 273, and Peet, above n 21, 51. See also UNEP Monaco above n 59, 6, GEO-3, above n 53, 19, Palmer above n 89.

largest economy in Latin America. Its population is approaching 100 million inhabitants and it depends heavily on oil production and tourism for its economic strength. The majority of both its oil and its tourism are located on and in the Caribbean.

Mexican environmental laws are reasonably stringent and comprehensive.¹⁰⁰ Article 27 of the 1917 Constitution states that public interests must be considered in the exploitation of natural resources. Environmental issues were not a serious consideration, however, until Mexico began to industrialize in the 1950–60's.¹⁰¹ In the late 1980's and early 1990's the Mexican government changed its view of natural resources in general, and the environment in particular, from a public good in need of protection to an economic resource. The result has been that environmental law is now created and subjected to a cost-benefit analysis.¹⁰²

Mexico has gone through turbulent economic times since 1973.¹⁰³ There have been three currency devaluations since that time, the last in 1994.¹⁰⁴ Real average earnings declined 20% in the four years following the last devaluation.¹⁰⁵ Given this difficult situation, it can hardly be questioned but that "Mexico's thirst for economic stability has led to the relaxation of environmental enforcement."¹⁰⁶ In addition to such activities as dumping

¹⁰⁰ S. Walker, "General Overview of Mexican Environmental Law" 1997, Southwest Texas State University, San Marcos, Texas <http://www.mtnforum.org/resources/library/walks97b.htm> at 25 July 2003.

¹⁰¹ G. Gonzalez and M. Gastelum, National Law Center for Inter-American Free Trade "Overview of the Environmental Laws of Mexico" (1999) <http://www.natlaw.com/pubs/spmxen13.htm> at 2 July 2003, sec. 1A no page numbers.

¹⁰² Walker, op cit, p. 6

¹⁰³ J. Warnock, *The Other Mexico: The North American Triangle Complete* (1995) 40.

¹⁰⁴ 1976, 1982, and 1994.

¹⁰⁵ J. Dames, "Note: An Examination of Mexico and the Unreasonable Goals of the United Nations Conference on Environment and Development" (1998) 10 *Fordham Env'tl LJ* 78

¹⁰⁶ Dames, *ibid* 79, see also, Warnock, *ibid*, 210-229.

untreated toxic wastes directly into the Rio Grande,¹⁰⁷ the river which marks Mexico's northern border with the United States and which empties into the Gulf of Mexico,¹⁰⁸ Mexico has courted foreign investment on the basis of relaxed environmental enforcement.¹⁰⁹

Mexico is a signatory to MARPOL 73/78, Annexes I and II, and to Cartagena. As a civil law jurisdiction, these ratifications require no further legislation to become law. The implementing legislation for these agreements, however, is not present.¹¹⁰ An effective bureaucracy to administer the responsibilities has not been created. The efficacy of the legal system is undermined by the internecine fighting between various governments and a corrupt judiciary.¹¹¹ Finally, Mexican law enforcement is less than consistent or transparent, to say the least.¹¹²

After its conspiratorial view in the 1970's that environmentalists were sponsored by multinationals opposed to the development of poor nation, the government began to develop a small bureaucracy to deal with the environment. The Mexican government

¹⁰⁷ For example, biologist, Jorge Barroso, noted 14 companies located in the Industrial Park Mesa de Otay which were dumping directly into

¹⁰⁸ Known in Latin America as the Rio Bravo.

¹⁰⁹ Noted, for example, in R. Cata, "Emerging Markets Liability in Latin America", 27 U. Miami, Inter-Am. L.R. 509, at p. 536, who observes Mexico's announcement of relaxing standards for environmental impact studies, (apparently in response to the peso devaluation in the previous year) and in general, Joel Simon, *Mexico en Riesgo*, (1998) Mexico, Editorial Diana, pp. 223-257.

¹¹⁰ Although the Mexican federal environmental website acknowledges its commitments under UNCLOS and MARPOL, curiously it does not refer to Cartagena. "About Us" <http://www.profepa.gob.mx/seccion.asp?sec_id=169&com_id=0> at July 21, 2003.

¹¹¹ Discussed generally in United Nations Office for Drug Control and Crime Prevention "Judicial Corruption in Developing Countries: Its Causes and Consequences," March 2001, Vienna, CICP 14, <http://www.unodc.org/pdf/crime/gpacpublications/cicp14.pdf>

¹¹² Noted in Simon, op cit, n. 105, p. 261. Cata observes "Although most Latin American Countries have already enacted environmental legislation, not all enforce these laws with the same zeal.", op cit n., 101, p. 533.

first acknowledged the seriousness of the situation when President Ernesto Zedillo (1994-2000) appointed biologist, Julia Carabias, as chief of the Secretariat of Environment, Natural Resources and Fisheries (SEMARNAP). Carabias observed: “we (inhabitants of Mexico) have reached a critical point in terms of environmental degradation.”¹¹³ The Mexican environmental agency states that the condition of the environment in Mexico is no less than “apocalyptic.”¹¹⁴ The United Nations, for example, has declared the mountainous regions of the State of Oaxaca the most eroded location on the planet.¹¹⁵ Exacerbating the seriousness of the situation is that this area is among the top 15 most important areas on the planet in terms of biodiversity.¹¹⁶

More specifically, despite Mexico’s reliance on the marine environment, it has not been able to protect it.¹¹⁷ Cancun, for example, an internationally renowned tourist destination, is Mexico’s jewel on the Caribbean. It borders on the second largest coral reef in the world, second only to Australia’s Great Barrier Reef.¹¹⁸ Cancun was developed as an unpolluted, non-third world alternative to Mexico’s previously favoured

¹¹³ Interview quoted in Simon, op cit, n 101 p. 260. Translation certified by the author.

¹¹⁴ Procuraduría Federal de Protección al Ambiente (PROFEPa) writes: “The challenge faced in the enforcement of the law is enormous. While advances were achieved by prior administrations, the results were not always favorable. In some cases, the results were adverse. For this reason, it is important that we take a realistic view of the current situation and undergo a process of self review. We recognize that the situation of the environment in Mexico, mainly with respect to natural resources, is apocalyptic.” “About Us” <http://www.profepa.gob.mx/seccion.asp?sec_id=169&com_id=0> at July 21, 2003 For a map of the erosion problem, see that prepared by Programa Para el Control de la Erosion y Restauracion de los Suelos de Oaxaca at <http://www.laneta.apc.org/pcers/erosion.html> at August 30, 2003.

¹¹⁵ Simon, op cit, p. 37. More than 80% of the state suffers from erosion and the level of erosion in one third of the state is in grave condition. For a map of the erosion problem, see that prepared by Programa Para el Control de la Erosion y Restauracion de los Suelos de Oaxaca at <http://www.laneta.apc.org/pcers/erosion.html> at August 30, 2003. This aspect of Mexico’s environmental situation is reflected elsewhere in Latin America. For example, in El Salvador, only 6% of its original forests are still in existence and 90% of its rivers are contaminated. Holley, p. 94.

¹¹⁶ Mexico’s Report to the United Nations Framework Convention on Climate Change, *First National Communication For The United Nations Framework Convention On Climate Change*, (2000) p. 25 at <http://unfccc.int/resource/docs/natc/mexnc1e.pdf>, at August 30, 2003.

¹¹⁷ For a general discussion about the state of the environment in Mexico, see, Simon, op cit, n. 99.

destinations of Acapulco, Puerto Vallarta and Mazatlan. The Mexican government has invested USD \$3 billion in the development of Cancun since it started in 1969. Private investors have invested an equal amount.¹¹⁹ Cancun has over 20,000 hotel rooms, receives more than 1.5 million tourists annually, and accounts for one third of Mexico's USD \$6.35 billion tourist income.¹²⁰ Cancun provides 2.7 million jobs or 9% of the active workforce.¹²¹

Today, Cancun's lagoon smells of human wastes and its sewage flows untreated into the Caribbean polluting beaches to the north as far as Puerto Juarez¹²² and killing the reefs on which part of its tourist appeal relies.¹²³ These environmental problems are starting to drive tourists away from Cancun and further south along the Caribbean coast.¹²⁴ The writers of the UN WCMC Atlas describe Mexico's Caribbean situation as follows:

Small reef patches, such as El Garrafon at Isla Mujeres and Punta Nizuc at Cancun, have been completely destroyed by tourism and impacts are becoming more evident elsewhere along the Cancun-Tulum touristic [sic] corridor, in places such as Akumal and Puerto Morelos, as well as the offshore island of Cozumel.¹²⁵

If this is occurring in the most important Caribbean location, within the jurisdiction of the region's second wealthiest Latin nation, it seems highly unlikely that much more is being done to protect the marine environment by neighbouring, poorer states.

¹¹⁸ Simon, op cit, p. 214.

¹¹⁹ Op cit, p. 212.

¹²⁰ Op cit. Simon notes that tourism follows only oil and manufacturing in terms of importance as a source of income for the Mexican economy.

¹²¹ Simon offers 604,000 in direct tourist employment and 1.5 million indirect jobs, op cit.

¹²² Observations from site visit to Cancun, March 2003, and noted in Table 2-3 CEP Technical Report 40 above n 52.

¹²³ See for example the maps on UN World Conservation Monitoring Centre at <http://www.unep-wcmc.org/> at August 26, 2003. http://www.earthvision.net/ColdFusion/News_Page1.cfm?NewsID=19131 at August 28, 2003. And the UNEP Coral Reef Unit website interalia, <http://coral.unep.ch/> at August 28, 2003.

¹²⁴ Simon, p. 199.

¹²⁵ Available http://www.earthvision.net/ColdFusion/News_Page1.cfm?NewsID=19131 at August 28, 2003.

As one of the WCR's major oil producers, Mexico should have considerable facilities to deal with oil pollution.¹²⁶ In addition, Mexico is home to a number of major cruise ship destinations. Yet none of its major WCR ports have adequate reception facilities.

Mexico also fails in its aerial surveillance of the WCR.

Finally, given Mexico's weak and corrupt policing and judicial systems, it can hardly be said that there is any meaningful enforcement of marine environmental law by Mexico.

Mexican environmental inspectors earn about \$150 USD per month and it is known that bribery is routine.¹²⁷ Indeed, the Mexican government under the Fox administration has recognized the problem of corruption among its environmental inspectors and has developed specific strategies to address it;¹²⁸ however, to date little has changed.

Mexico's failure to successfully implement many aspects of Cartagena do not speak well of the situation elsewhere in the WCR.¹²⁹

¹²⁶ Oil spills are first the responsibility of the Navy, then PEMEX, the state-owned oil monopoly in Mexico. ITOPE's country profile of Mexico identifies PEMEX as has considerable facilities; however, the ability of PEMEX to respond, again because of in-fighting among its corrupt officials makes it questionable.

¹²⁷ Simon, op cit n. 105, p. 262.

¹²⁸ Procuraduría Federal de Protección al Ambiente, *La Ley Al Servicio de la Naturaleza*, Líneas Estrategias, http://www.profepa.gob.mx/seccion.asp?it_id=972&sec_id=147&com_id=0

¹²⁹ See the views of L. Katz de Barrera-Hernandez and A. Lucas, op cit n. 89. Concerning SPAWs they observe "countries international commitments may... be linked to the widespread enactment of framework legislation.... However, in most cases these laws do not go beyond basic enabling statutes and their implementation is generally deferred, with demarcation and management plans to be completed at a later date." Pp. 222-223. This conclusion is supported by M. Holley's study, "Sustainable development in Central America: translating region environmental accords into domestic enforcement action." (Feb 1998) 25(1) *Ecology Law Quarterly* 89.

8. CONCLUSION

There are a number of conclusions which can be drawn from this brief study. First and foremost, the current system of environmental protection is failing to protect adequately the environment of the WCR. Countries need to address the issues blocking implementation. Clearly, one important aspect will be finding some means of improving political will, perhaps by a different incentive scheme.¹³⁰ This problem is something that must be addressed by the developing countries.

As well, a major reason for failure to protect the environment of the WCR from its two most serious pollution threats, sewage and oil, is the lack of finances.¹³¹ The third world's problem with lack of finances was acknowledged and addressed at Rio. Agenda 21 of the Rio Convention committed the developed countries to contribute 0.7% of the GNP to developing countries for sustainable development and Agenda 21 implementation. Unfortunately, the developed countries, with few exceptions,¹³² have not followed through.¹³³ And even if they had, the perception among poorer countries is

¹³⁰ Taken up by Brown Weiss, p. 691-695. Simon notes that trade talks with the USA and Canada concerning NAFTA were critical in drawing President Salinas' attention to environmental issues in Tijuana. Op cit, n. 99, p.

¹³¹ Nelson Andrade Colmenares, Coordinator of CEP observed "Our major constraint is financial, as the Caribbean countries are not always able to match their expressed support for the CEP with contributions to the Trust Fund." In *Wider Caribbean, "Regional Seas: Strategies for Sustainable Development."* Op cit, n. 2, p. 15.

¹³² Denmark, Norway, Sweden and the Netherlands contribute in excess of 0.7% of their GNP.

¹³³ By 1995 most had decreased their contributions to 0.27% of GNP. (Dames above n 94, 89.) Not surprisingly the Rio follow-up, Rio+5, was not a marker of great success. (On a practical level, Rio + 5 noted a significant increase in carbon dioxide emissions, a decrease in freshwater availability, and that the number of people living in absolute poverty had increased. The authors of the Latin America Synthesis Report above opine "it can be assured that in general terms... the countries of Latin America show a significant advance." 2. No other sources researched for the present study supported an optimistic view of the situation.) In fact, leaders from many developing countries, including Mexico, refused to attend in protest of the developed world's failure to deliver on promised financial and technological assistance.(noted in Dames ibid, 91). When criticized for this failure, the USA's Assistant Secretary of State remarked that the developing nations such as those that form the majority of the WCR had better be

that the 0.7% figure hardly demonstrates a serious commitment to environmental protection.¹³⁴

Given the USA's position as the world's largest economy and largest polluter, it has a moral obligation to assist in financing pollution reduction and control activities. Its current position as the lowest contributor of aid among developed nations is morally reprehensible. The recent administrations have failed to step up to the challenge of being world leaders in this most significant sense.

Further as, Michael Julian, chair of the IMO's Marine Environment Protection Committee, observes, users—and in particular oil companies which have the greatest need for such facilities—should be paying should be paying for port reception facilities.¹³⁵ The current environmental degradation resulting from responsibility for these costs being placed with impoverished Caribbean governments is inevitable if the financing situation remains as it is. A disproportionate amount of environmental damage is being done in poor countries to meet rich countries demand for cheap oil.¹³⁶

The problem of environmental degradation is not limited to the WCR. Nor has the current international environmental legal regime succeeded to any significant extent in

practical and realize that the USA is never going to contribute the 0.7%, regardless of its commitments (Cited in Dames, above n 94, 91-2). In other words, the USA wishes to continue to exploit the WCR for its oil and tourism needs while avoiding paying the full costs of those activities.

¹³⁴ Manuel Ludevid Anglada, *El Cambio Global en el Medio Ambiente*, (1998), Mexico, Alfaomega Gupro. p. 316.

¹³⁵ M. Julian, "MARPOL 73/78: the International Convention for the Prevention of Pollution from Ships" *Maritime Studies*, (July-August 2000) 19.

¹³⁶ UNEP Monaco, above n 59, 25.

stopping or reversing environmental degradation.¹³⁷ It may be that as various authors have proposed that a whole new approach to environmental law making is needed. These scholars suggest an international legal regime, such as an empowered WTO equivalent which ignores sovereignty, create and enforce environmental legislation.¹³⁸ This interesting suggestion has yet to be taken very far.

Other suggestions could include negotiating treaties which address the financial issue and the lack of political will at the outset by committing signatories specify and allocate a percentage of GDP as a mandatory contribution for monitoring and enforcement. The legislation would take effect the year after the current incumbent government's term expires. Such a term could be reviewable and alterable upon a five year period and a majority basis. The lack of start up funds and the weakening commitment to programs over the long term may be addressed by such a mechanism.

Another important modification to environmental treaties would be to grant standing to interested parties in the jurisdiction of their choice. For example, given the conflicting interests governments find themselves in with respect to economy versus environment, granting standing to environmental groups to bring enforcement litigation in the courts of their choice would certainly increase the power of such treaties. Individuals with such

¹³⁷ Palmer above n 89 notes: "While the number of instruments is impressive, and some of them will have slowed down degradation, it cannot be assumed that they have lead to an improvement in the overall situation. A strong argument can be made that, during the time these instruments were being developed the environmental situation in the world became worse and is deteriorating further.", p. 263. And GESAMP reports on the oceans specifically, "Degradation of the oceans continues on a global scale, despite progress made during the last three decades in some places and on some issues." GESAMP, "Oceans at Risk," Report of the Twenty-eighth Session, (1999).

¹³⁸ See for example, Palmer above n 89, 276-283, or economist, J. Hogendorn, *Economic Development*, 3rd ed. (1996), 593 ff.

interests are much more likely to monitor and take enforcement measures when they are given the power to litigate.

Finally, for effective enforcement, technical standards and specifications must be set and published early on in the process. While the argument is made that treaties get bogged down and die in the process of negotiating the details, non-contentious, minimal standards could be set, again on a renegotiable basis on a five year time frame. Such an approach would at least start the process. Information about potentially harmful activities and proposed activities must be widely disbursed as soon as possible. This distribution of information is critical if NGO's are to be involved in the monitoring and enforcement aspects. The current lack of standards and publication makes it difficult to know who is doing what to the environment. The lack of enforcement permits polluters impunity.

Cartagena has not been the shining success it could have been. No country has fully lived up to its environmental responsibilities. That strategy appears to be strategy of most nations, which can only result in the tragedy of the commons warned about nearly forty years ago.¹³⁹

¹³⁹ Garrett Hardin, "The Tragedy of the Commons," *Science*, 162(1968):1243-1248.

**APPENDIX I - MAJOR TANKER SPILLS OF OVER 5,000 TONNES
IN THE CARIBBEAN SINCE 1974**

Vessel Name	Quantity spilled		Country	Year	Cause
	(tonnes)	(Type)			
ATLANTIC EMPRESS	287,000	CRUDE	LESSER ANTILLES	1979	COLLISION
EPIC COLOCOTRONIS	60,000	CRUDE	LESSER ANTILLES	1975	FIRE/EXPLOSION
BURMAH AGATE	36,000	CRUDE	USA	1979	COLLISION
SCORPIO	32,000	CRUDE	MEXICO	1976	GROUNDING
CYS DIGNITY	16,000	CRUDE	VENEZUELA	1979	GROUNDING
LSCO PETROCHEM	16,000	FUEL OIL (cargo)	USA	1976	GROUNDING
AEGEAN CAPTAIN	14,000	CRUDE	LESSER ANTILLES	1979	COLLISION
OSWEGO TARMAC	11,000	BITUMEN	LESSER ANTILLES	1977	COLLISION
ALVENUS	8,500	CRUDE	USA	1984	GROUNDING
PRINCESS ANNE MARIE	6,500	CRUDE	CUBA	1980	GROUNDING
MASTER MICHAEL	6,000	FUEL OIL (cargo)	Caribbean Sea	1979	
MEGA BORG	5,700	CRUDE	USA	1990	FIRE/EXPLOSION
ARKAS	5,000	CRUDE	USA	1982	COLLISION