

13. MARINE POLLUTION

I. Introduction

1. The marine world is both majestic and fragile. Big, beautiful, powerful, life supporting, ancient and mysterious, the world's waters are also delicate and vulnerable. The earth's oceans and seas need protection by and from the planet's dominating species. This chapter presents an overview of international environmental law for protection of the marine environment from pollution.
2. The chapter begins with a description of the environment and of its pollution threats. It proceeds to consider applicable international law, beginning with a brief explanation of the process that built consensus among states to take international legal action. International standards for control of marine pollution are surveyed according to pollution sources. Implementation of international agreements always requires some action at the national level and many agreements require parties to create national laws as a way of implementing the measures required by the agreements. Therefore, this chapter examines some examples of national laws that have been created to implement one or more of the international agreements.
3. The oceans are thought to have been formed as a result of icy comet collisions with the Earth occurring from 4.5 to 3.9 billion years ago, forming steam which gravity condensed and pulled into depressions in the planet's surface. The Earth's major oceanic depressions form the Pacific, Indian, Atlantic, Southern and Arctic Oceans. These oceans are a thin film over the Earth's surface, on average, only a few kilometres deep. Oceans and seas currently cover approximately 71% of the Earth's surface, 360 million square kilometres. This thin layer of oceans forms about 90% of the Earth's biosphere, by volume, and was the original source of life on Earth about four billion years ago. Oceans and seas contain the greatest amount of life by mass.
4. In law, the marine environment is divided into maritime zones. These comprise areas within national jurisdiction, such as the territorial sea, exclusive economic zone and continental shelves, as well as areas beyond national jurisdiction, such as the high seas and deep seabed. The sovereignty of a state extends, beyond its land territory and its internal waters, to a belt of sea adjacent to its coast, described as the territorial sea. This area typically

extends 12 nautical miles from the state's coast. The exclusive economic zone is an area beyond and adjacent to the territorial sea, typically extending 200 nautical miles from the state's coast. A continental shelf of a coastal state comprises the submerged prolongation of the land territory of the coastal state - the seabed and subsoil of the submarine areas that extend beyond its territorial sea to the outer edge of the continental margin. A state may be able to assert jurisdiction in some matters to the edge of its continental shelf even if it extends beyond the exclusive economic zone. Areas beyond national jurisdiction must be managed cooperatively. Further, the flows of the ocean's currents run through national jurisdictions but cannot be permanently held or managed there. Accordingly, contaminants cannot be contained within the maritime jurisdiction of one source state. They must also be managed cooperatively.

II. International Framework

1. The Problem

5. Why protect the marine environment from pollution? Seas and oceans perform important ecological functions and provide many benefits to human beings. They are home to numerous animals, plants and other marine organisms that form marine ecosystems and support the livelihoods of hundreds of millions of people. Diverse marine organisms and their genetic resources could hold cures for many of the ailments that we face. Marine fishing is fundamental to the economies of many countries.
6. Fish and many other marine organisms cannot survive in polluted waters that are toxic to them. Marine organisms that are used for food can become contaminated with substances such as mercury, which is harmful to human beings. In addition to chemical substances, items like fishing lines, metal rings, straps, glass and plastics hamper the mobility of marine animals. Once entangled, marine mammals and other organisms have trouble breathing, eating or swimming, all of which can result in their death. Items such as broken glass and chemicals can also harm swimmers and other people using the marine environment.
7. The regulation of marine pollution is usually analyzed according to the identified source producing the marine pollution. The sources and their respective contribution to marine pollution load (by mass) are: land-based (82%), vessel-based (9%), dumping of waste at sea (8%) and off-shore activity (1%).

8. Land-based sources include sewage outfalls, industrial discharges, runoff from urban stormwater and agriculture, river borne and airborne pollution, and litter. Vessel-based sources include operational discharges such as bilge water discharges, but not the operation of a vessel for the purpose of discharging waste, as that is dumping. Pollution from vessels can take the forms of oil, chemicals, lost cargo and equipment, sewage, garbage, fumes and invasive exotic species. Dumping is the deliberate disposal of wastes at sea. Offshore activity generates minor pollution primarily through the use of oily drilling muds and by production blow outs.

Example: Torrey Canyon

On 19 February 1967, the "Torrey Canyon" left Kuwait. She was the first of the big supertankers, carrying a full cargo of 120,000 tons of oil. On 18 March, she struck Pollard's Rock in the Seven Stones reef between the Scilly Isles and Land's End, England. 31 million gallons of oil leaked from the ship and spread between England and France, killing marine life along the Cornish coast of Britain and the Normandy shores of France, blighting the region for many years. The spill left destitute many families and businesses dependent on sea resources for sustenance.

Investigations revealed that the accident resulted from a combination of factors, including:

Poor ship design ,
poor operational scheduling,
incompetence of the crew and
poor navigational procedures.

The ship's operations involved many countries. At the time, the Torrey Canyon was owned by a subsidiary of Union Oil in the United States, registered in Liberia, chartered to BP Shell in the UK, and operated by Italian crew. The vessel left Kuwait for an unknown destination and the slick affected French and English waters. There were no emergency procedures and disaster response strategies stipulated in international law at the time. The situation raised numerous questions, including which state was responsible to check that the vessel was safe.

9. The grand scale upon which humans make use of marine resources is placing pressure on various marine ecosystems. In some cases, different uses conflict with and undermine each other. For example, waste disposal has undermined fishing and recreation in some areas. In some cases, over fishing has exhausted marine resources or destabilized part of the marine ecosystem. For example, exotic organisms transported in ship ballast water are invading new ecosystems. As pollution has increased, the assimilative capacity of semi-enclosed seas, in particular, has been nearly exhausted, resulting in negative impacts on related health, and on economic and social activities.

2. The Law of the Sea Process

10. In the mid-twentieth century, international competition over rights to harvest fisheries in outside of territorial waters led to disputes between states. Extraction of hydrocarbons and minerals from the continental shelf and deep sea bed, respectively, also led to disputes among states. Increasing populations and technological advancements created impetus for states to assert claims of national jurisdiction further from the coast, setting them on collision courses. The United Nations took up the issues and, in an effort to find lasting solutions to the problems, tasked its International Law Commission to codify principles customarily applied by states to their uses of the sea. The work of the Commission led to the gradual development of a number of conventions that addressed, *inter alia*, marine pollution issues.
11. The first United Nations Conference on the Law of the Sea, held in 1958, adopted four separate Conventions on laws of the sea. Respectively, they dealt with the high seas, the territorial sea and the contiguous zone, the continental shelf, and fishing and conservation of the living resources of the high seas. A voluntary protocol was also adopted requiring the compulsory settlement of disputes that might arise between parties as a result of interpretation or implementation of the conventions. However, the four Conventions did not address the problem of marine pollution in any detail and were overtaken by subsequent international agreements.
12. A second conference on the Law of the Sea in 1960 was unproductive but a third was a major success in producing agreement. It was convened in 1973 and met twice a year until 10 December 1982, when the omnibus United Nations Convention on the Law of the Sea ("UNCLOS") was adopted. UNCLOS entered into force on 16 November 1994 and has 148 parties (April 2005). In the twelve-year period prior to its entry into force, some of the provisions of UNCLOS had matured into customary international law and became binding on all states.
13. UNCLOS establishes the international legal order of the oceans. The variety of subjects dealt with is covered in a total of 320 articles, divided into seventeen parts, each part dealing with a broad subject concerning the sea. In addition, UNLCOS has nineteen Annexes, each dealing with a specific marine issue. The subject of prevention of marine pollution is covered mainly under part XII of UNCLOS. Some relevant rules are located in other parts, especially part II, concerning the territorial sea, and part XI, concerning the deep sea bed.

3. The Law of the Sea and the Marine Environment

14. Part XII of UNCLOS is a ground-breaking achievement, entirely dedicated to protection of the marine environment. The 45 articles apply to seas and oceans forming the territories of parties, and their exclusive economic zones including the sea bed and to the high seas, ocean floor and ice-covered areas. It is set out in sections that concern general provisions, global and regional cooperation, technical assistance, monitoring and environmental assessment, international rule formation, enforcement, safeguards against inept enforcement, ice-covered areas, responsibility and liability for pollution damage and sovereign immunity.

15. The definition of marine pollution in UNCLOS (article 1(4)) is:

"...Introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries which results or is likely to result in such deleterious effects as harm to living resources and marine life hazard to human health, hindrance to marine activities, including fishing, and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities."

This definition raises the problem of identifying thresholds for the various threats described in it. Implicit in that problem is identifying what the assimilative capacity of the marine environment is since the scientific understanding of the ocean's assimilative capacity is not well advanced.

16. The key provisions of UNCLOS include:

- Article 192 which states the obligation to protect and preserve the marine environment;
- Article 193 which preserves the sovereign rights of states to exploit their own natural resources reflecting the concern of many countries, particularly developing countries, to ensure that they are not obstructed from following the quickest possible path to industrial development;
- Article 194 which provides that states are to take all measures necessary to prevent, reduce and control pollution of the marine environment using the best practicable means at their disposal and in accordance with their capabilities. The environment protection obligations are heavily qualified by reference to the limits of state capabilities and, later, by reference to their sovereign right to exploit their natural resources. Article 194 also sets out the

obligations for states not to cause damage by pollution to other states and their environment or areas beyond those where states exercise sovereign rights, that is, the high seas. Article 194 is based upon obligations in customary international law, as articulated in the *Trail Smelter* and *Corfu Channel* cases, and Principle 21 of the Stockholm Declaration; and

- Article 195 which imposes a duty not to transfer pollution from one type to another, or from one area to another. For example, sewage can be a land-based source when discharged from an ocean outfall, but may be transformed into a dumped source if it is partially treated and the sludge is then dumped at sea by a barge.

17. It has been almost three decades since these general principles were formulated and other, newer principles have since caught the imagination of the international environmental community. In addition to the notion of sustainable development, there are the precautionary principle, integrated ecosystem management, biodiversity conservation, use of best available technologies or environmental practices, and the eclipse of the notion of the right to maximize use of the oceans assimilative capacity. In relation to these newer concepts, UNCLOS is largely silent, but provides a vehicle for separate new legal initiatives. For example, article 194(3)(a) requires the parties to minimise release of toxic substances to reduce the potential of their reaching the marine environment. This provision has relevance to the implementation of the Stockholm Convention on Persistent Organic Pollutants of 2001.

18. Other important aspects of UNCLOS include:

- Article 198 requiring states to immediately notify others deemed likely to be affected by any form of threatening pollution, whether it emanates from activities or areas under the jurisdiction of the notifying state or not;
- Article 202 requiring states to cooperate in scientific research and information exchange, and to jointly conduct the research necessary to establish appropriate scientific criteria for the formulation of rules to protect the environment;
- Article 203 obligating states to provide scientific and technical assistance to developing states to enhance their capacity to protect the marine environment, specifically including the preparation of environmental assessments and assistance in minimizing the effects of major pollution incidents;
- Article 204 mandating that states keep under particular surveillance the effects of any

- activities that they engage in directly or permit in order to determine whether those activities are likely to pollute the marine environment. This is a relatively low threshold for the requirement to identify activities that are to be kept under surveillance;
- Article 205 providing that states must publish reports of the results obtained by their monitoring activities;
 - Article 206 requiring states to assess the potential effects of activities which they have reasonable grounds to believe may cause substantial pollution or significant harmful changes to the marine environment and to communicate such reports to the competent international organizations. The latter assessment is also, in effect, an obligation to conduct Environmental Impact Assessments ("EIA");
 - Article 213-233 providing for enforcement through investigation of violations, criminal proceedings against offenders, imposition of monetary penalties against offenders and several other sanctions and remedies, as well as limitations on enforcement;
 - Article 235 providing that parties shall be responsible and liable for pollution damage under international law should they fail to carry out their duties and responsibilities; and
 - Article 237 providing that UNCLOS should be implemented without prejudice to the environmental obligations imposed under other treaties relating to the marine environment.
19. In case any disputes arise as a result of the interpretation or implementation of the provisions of the Convention, they are to be resolved in the manner provided for by the Convention. Parties have an obligation under part XV to settle all their disputes by peaceful means. Part XV sets out a compulsory procedure for binding dispute resolution that is unique among environment protection treaties. First, parties are obliged to conciliate. If conciliation fails, they must resolve the dispute by means of a binding decision handed down by their choice of either the International Tribunal for the Law of the Sea ("ITLOS"), the International Court of Justice ("ICJ") or by an arbitral panel. Either a general panel (Annex VII) or a specialist environmental panel (Annex VIII) can arbitrate the dispute.
 20. Chapter XII of UNCLOS sets out a broad framework for comprehensive measures to control marine pollution. Although drafted a quarter century ago and prior to the development of the sustainable development paradigm, its provisions still provide a solid basis for the prescription of standards and for their enforcement regimes. The provisions are supplemented by a range of treaty laws that prescribe standards in much greater detail for more narrowly defined sources of pollution or for particular regions.
- #### 4. Land-Based Sources of Marine Pollution
21. The vast majority of marine pollution comes from land-based sources. These include sewage outfalls, industrial discharges, runoff from urban storm water and agriculture, river borne and airborne pollution and litter. Land-based sources of marine pollution can also be transported through the air, such as by vehicle emissions. Enclosed or semi-enclosed seas are especially vulnerable to land-based sources.
 22. Recognizing that control of land-based sources of marine pollution was failing, the 1992 United Nations Conference on Environment and Development agreed to advance the subject. Agenda 21 invited the United Nations Environment Programme to convene a meeting on land-based sources as soon as practicable and identified priority actions for control of these sources, including eliminating the discharge of organ halogen compounds that threaten to accumulate to dangerous levels in the marine environment, reducing of discharge of other synthetic organic compounds and promoting controls over anthropogenic inputs of nitrogen and phosphorous, which cause eutrophication. Agenda 21 also recommended updating the 1985 Montreal Guidelines for the Protection of the Marine Environment against Pollution from Land Based Sources, assessing the effectiveness of regional agreements on land-based sources and the formulating of new regional agreements where appropriate, and providing guidance on appropriate technologies and the development of policy guidance for relevant global funding mechanisms.
 23. The proposed international conference on land-based sources of marine pollution was held in Washington, DC, in November 1995. It produced a Declaration and an Action Plan, for which UNEP is Secretariat. Financing for some aspects of implementation is available through the International Waters Funds of the Global Environment Facility ("GEF").
 24. International management of land-based sources of marine pollution lends itself more to regional approaches than to global ones. As the most intense pollution from land-based sources tends to

be local and its effects magnified in enclosed and semi-enclosed sea areas, and as states located in a common region tend to share a common level of economic development and common environmental conditions, regional arrangements are more apt.

5. Vessel-Based Sources of Marine Pollution

25. The first regional regimes for land-based source of marine pollution were adopted for the Baltic and Northeast Atlantic Seas. These were the 1974 Convention on the Protection of the Marine Environment of the Baltic Sea Area ("Helsinki Convention") and the 1974 Convention for the Prevention of Marine Pollution from Land-Based Sources. In 1992 each was revised and updated. Respectively, they are now the 1992 Convention on the Protection of the Marine Environment of the Baltic Sea Area and the 1992 Convention for the Protection of the Marine Environment of the North-East Atlantic. Regional protocols concerning land-based sources of marine pollution are in place for three regions: Mediterranean Sea ("1980 Athens Protocol"), South-East Pacific ("1983 Quito Protocol"), Arabian Gulf ("1990 Kuwait Protocol") and Protocol concerning Pollution from Land-Based Sources and Activities on 27 October 1999.
26. The regional conventions and protocols each adopt similar definitions of land-based sources of marine pollution and similar regulatory approaches. They cover marine pollution from the coast, watercourses and through the atmosphere. They vary from each other in relation to coverage of offshore installations and waste disposal under the seabed accessed by tunnel or pipeline.
27. The regional conventions also adopt similar approaches to the regulation of land-based sources of marine pollution. Release into the marine environment of "black listed" substances set out in an annex is prohibited. Most of the conventions black list heavy metals such as cadmium and mercury, persistent organic compounds such as organohalogens and organochlorines and radioactive substances. Release into the marine environment of "grey" list substances set out in another annex is typically restricted and subject to authorization by the coastal state. Authorization is conditioned on such factors as the characteristics and composition of the substance, impacts on the receiving environment and the availability of alternatives such as waste production avoidance and alternative disposal methods. Airborne pollution is addressed merely by referring to an obligation to comply with other existing and applicable international standards, of which there are few.
28. Pollution from vessels can take the forms of oil, chemicals, lost cargo and equipment, sewage, garbage, fumes and invasive exotic species. Oil pollution comprises about 71% of vessel-based marine pollution. Discharges may be accidental (9.4%) but are mostly operational, such as through diesel emissions in fumes, or oil residue in bilge and ballast water and hull washings (62%). The total annual oil spillage into the oceans is estimated at one million tonnes dumped in standard operations and 200,000 tonnes spilled in tanker accidents per year. In addition, 250,000 tonnes of oil spill annually results from retirement of oil vessels from transportation activities. Chances of vessel accidents and resultant pollution are increased by inadequate port facilities, poor or improper construction and maintenance of vessels and inadequate capacity of vessel crew to safely operate them.
29. The International Maritime Organization ("IMO") addressed vessel-based marine pollution prior to the negotiation of UNCLOS. As a result, UNCLOS did not elaborate operational controls for vessels, instead referring to standards established by the "competent international organization," in this case the IMO. The IMO was established in 1948, with a mission to promote safer shipping and cleaner seas. It has the responsibility, *inter alia*, to establish rules for prevention of marine pollution from ships.
30. The first of IMO Conventions on marine pollution was the International Convention for the Prevention of Pollution of the Sea by Oil ("OILPOL"), adopted in 1954. It applied to tankers engaged in the transportation of oil. Articles I, II, III, and IV prohibited discharges of oil into the sea except under specified conditions. It prohibited discharge of persistent oil or oily mixtures of greater than 100 parts per million ("ppm") within fifty nautical miles ("nm") of land or within special areas and regulated the rates of discharge (e.g. to a rate of sixty litres/nm to a maximum of 1/15,000 of oil cargo). However, exemptions applied if no oil reception facilities were available in the port of destination and the lack of available reception facilities at oil terminals remains a problem today, especially in developing countries.
31. Requirements introduced in 1969 mandated that new oil cargoes be loaded on top of old ones and that tankers be washed out with high pressure crude oil which is retained rather than sea water that is discharged, resulting in a 30% drop in

- discharges. In 1971, separate ballast tanks became mandatory, so that oil cargo tanks did not need to be filled with sea water as ballast. Special areas where no discharges were permitted were declared, including the Great Barrier Reef, the Black Sea, the Baltic Sea and the North Sea.
32. However, OILPOL dealt only with oil, leaving out other contaminants that might be discharged during sea transportation activities. It also left out many issues concerning marine pollution, such as measures to avoid tanker accidents and safety at sea. It did not address matters concerning compensation to those who suffer financially as a result of pollution, proper vessel design and construction and marine rescue systems and crew standards, all of which have a bearing on marine pollution. In light of increased sea transportation activities and steady increases in the sizes of vessels, the threats of pollution loomed prominently. The problem was dramatized by the "Torrey Canyon" disaster, described earlier.
 33. The IMO's efforts to develop more comprehensive measures to address marine pollution beyond just oil led to MARPOL, the International Convention for the Prevention of Pollution from Ships. The Convention was adopted in 1973, altered in 1978, and entered into force in 1983 superseding OILPOL. 1973 MARPOL applies to ships flying or entitled to fly the flag of parties and ships operating under the authority of a party but excludes warships, naval auxiliary and/or ships owned or operated by a state and used only on government non-commercial service (article 3). MARPOL has 127 parties.
 34. The core of 1973 MARPOL lies in its annexes which deal with all types of pollution by ships (excluding dumping), rather than oil discharges alone. MARPOL's six annexes deal with: (I) pollution by oil, (II) pollution by noxious liquid substances in bulk, (III) pollution by harmful substances carried by in packaged form, (IV) sewage, (V) garbage, and (VI) air pollution. Other than Annexes I and II, Annexes III, IV, V and VI are optional and can be ratified separately from the main body of MARPOL. This results in different parties being signatories to the various Annexes. All the Annexes have entered into force, except Annex VI. Annex I sets out rules for controlling oil pollution, incorporating OILPOL. Annex V prohibits the disposal at sea of certain kinds of garbage, such as rope, plastic and fishing nets, but permits disposal of food and other specified wastes.
 35. Key provisions of 1973 MARPOL include:
 - Articles 4, 5 and 6 requiring states to create and enforce appropriate national laws implementing MARPOL;
 - Article 5 requiring parties to inspect ships flying their flags or operating under their authority to determine their compliance status before issuing them with certificates that authorize operation. Inspection of oil tankers is required before an International Oil Pollution Prevention Certificate is issued and a ship is authorized to operate an oil transporter and, thereafter, at intervals of not more than five years;
 - Article 6 authorizing parties to inspect foreign ships entering their territorial waters to determine whether they have discharged any harmful substances into the territorial waters or elsewhere and, if so, to institute court proceedings;
 - Article 6 authorizing parties to carry out inspection of all ships in their ports to determine whether they have compliance certificates and, if they do not, to deny them sailing rights. Article 7 establishes that inspections are to be conducted in an expeditious manner to avoid undue delay or detention of a ship; and
 - Article 10 requiring disputes concerning the application or interpretation of MARPOL to be resolved through negotiation, and, if parties do not agree, be submitted upon request of any of them to arbitration.
 36. Work by the IMO on vessel accidents and emergencies that threaten the marine environment led to the development of the International Convention on Oil Pollution Preparedness, Response and Cooperation ("OPRC") adopted in 1990, which came into force in 1995.
 37. The OPRC mandates that parties establish national measures to deal with vessel accidents that threaten to pollute the marine environment that include requirements that:
 - Vessels flying their flags, installations operating in their territorial waters and persons undertaking land-based activities within their jurisdiction that might lead to pollution of the marine environment must prepare plans to deal with oil pollution emergencies (article 3(1)).
 - Vessel operators adopt an oil pollution emergency plan developed by the IMO, known as Shipboard Oil Pollution Emergency Plan and carry it at all times to guide them on what to do in case of emergency.
 38. The OPRC also requires parties to establish national systems, including detailed plans, for responding promptly to oil pollution accidents

- (article 3(2)) and training and equipping people to combat oil spills and for making oil spill combating equipment available. Parties are also required to establish regulations and procedures for ship operators to report any pollution incidents to coastal authorities and other responsible governmental bodies for action to be taken in accordance with provisions of the Convention (article 4).
39. In addition to pollution emergency control measures at the national level, OPRC require parties to establish systems for cooperation to assist each other in the event of an oil vessel accident or other emergencies threatening to cause marine pollution. Several such systems have been established at sub-regional levels, such as for the Mediterranean Sea.
 40. The International Convention on the Control of Harmful Anti-fouling Systems on Ships was adopted in 2001. It is designed to protect the marine environment and human health from the harmful effects of organotin-based anti-fouling systems on ships, such as tributyltin ("TBT"). It has not yet entered into force but prohibits the application of harmful anti-fouling systems on ships from 1 January 2003. By 1 January 2008, all ships will be banned from having such compounds on their hulls or external surfaces or will be required to have a coating that forms a barrier to stop such compounds leaching from the underlying non-compliant anti-fouling systems.
 41. The most recent vessel standard developed by the IMO is the International Convention for the Control and Management of Ships Ballast Water and Sediments, adopted on 13 February 2004. Its objective is to minimize and eliminate the international transfer of marine pests and pathogens contained in ships' ballast water and sediments. Vessels must carry a Ballast Water Record Book and a certificate that indicates they are properly equipped. Parties are required to ensure that there are adequate reception facilities in ports where cleaning or repair of ballast tanks occurs so that ballast water and sediment can be discharged into them.
 42. Vessel-based pollution control standards have gradually moved away from discharge limits to design and equipment standards. These are easier to enforce and more effective in preventing pollution. Vessel activities at sea are largely unmonitored and unknowable. Surveillance, boarding, inspections and detentions are resource intensive, cumbersome and expensive. Wise drafting is essential to avoid reliance on complicated and expensive enforcement actions while still implementing marine environmental standards. A useful technique to promote more cost-effective implementation is to interlink responsibilities and powers for enforcement across an international network of governments. For example, allocating to each flag state, coastal state and port state a share of policing powers and responsibilities can improve policing of vessel-based pollution. Enforcement provisions in UNCLOS seek to achieve this outcome.
 43. Under UNCLOS article 217, the role of the flag state in policing vessels remains strong but is not exclusive. Flag states are to adopt laws to effectively enforce international norms and to prohibit vessels which are not in compliance with international norms from sailing. They are also to ensure that their vessels carry the certificates required and issued pursuant to international rules and must immediately investigate violations when requested by other states, regardless of where the violation occurred. Where a vessel is voluntarily in port, the port state may prevent a vessel from sailing where it is in breach of international standards and threatens to cause marine pollution (UNCLOS article 219). The port state is also permitted under article 218 to undertake investigations and institute proceedings related to a polluting discharge by a foreign vessel on the high seas, which violates applicable international rules. Under the Memoranda of Understanding on Port State Control first signed by European States in 1982 and by other regional states in the 1990s, port states agreed to conduct inspections of vessels in port. These undertakings ensure that most vessels are subject to regular examination for compliance with applicable international pollution prevention and safety standards. Non-compliant vessels may be detained until appropriate remedial action has been taken. UNCLOS also authorizes coastal states to physically inspect and to detain vessels within the territorial sea or exclusive economic zone (article 220).
 44. International marine pollution liability regimes are agreements that enable persons to receive compensation where an international shipping activity has caused pollution. The fundamental elements are a defined pollution incident which has caused damage to the covered interests of those persons. The ship owner is strictly liable for paying compensation up to a defined limit set out under the liability regime. The compensation is paid through the courts where the injury was suffered.

45. Those liability regimes currently in force are the 1969 International Convention on Civil Liability for Oil Pollution Damage and the 1971 International Oil Pollution Compensation Fund Convention. (See Chapters 5 and 11 of this Training Manual). The latter applies where a ship owner is not financially capable of, providing compensation and provides a limited amount of additional compensation where the pollution damage suffered exceeds the compensation available under the Civil Liability Convention. Article 235 of UNCLOS urges further development of liability regimes.
46. In 1997, the IMO adopted a Convention on civil liability for marine pollution caused by hazardous and noxious substances. However, neither this Convention nor the 2001 Convention on Civil Liability for Marine Pollution caused by Bunker Oils have come in to force.

6. Dumping of Wastes at Sea

47. Dumping is the deliberate disposal of wastes at sea. Typical kinds of dumped wastes include dredged spoils, building construction debris, sewage sludge and municipal garbage. In international law, dumping covers operations by vessels, aircraft or offshore installations for the purpose of waste disposal, including the disposal of the vessels, aircraft or offshore installations themselves. Dumping typically excludes disposal of wastes generated incidentally to the ordinary operations of vessels, aircraft or offshore installations since these activities are primarily covered under regimes specific to these types of operations (UNCLOS article 1(5)).
48. UNCLOS provisions on dumping require that national laws must be no less effective than global rules and standards (article 210.6)). The 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter (known as the "London Convention"), administered through the IMO, establishes the global rules and standards for dumping. For those states not party to the London Convention, UNCLOS has the effect of indirectly bringing the wider community of UNCLOS parties into line with the London Convention.
49. Under UNCLOS, waste dumping is subject to a permit system (article 210(3)) which is to be enforced by coastal states which has veto power over dumping in its territorial sea and exclusive economic zone or onto its continental shelf, flag states and waste loading states (article 216). Therefore, several permits may be needed from the various responsible states. The London Convention provides the details.
50. Article 4 of the London Convention prohibits dumping of hazardous wastes and substances into all marine environments, including high seas and territorial waters. Annex I sets out the "black list" of wastes for which no permits may be granted. The prohibited substances listed in Annex I include organochlorine compounds, mercury and mercury compounds, persistent plastics, high-level radioactive wastes and materials produced for chemical warfare. Article 5 allows the dumping of Annex II substances, for which permits may be issued subject to conditions specified in Annex III. The Annex II "grey list" substances include low concentrations of certain metals and incinerator ash.
51. Article 7 of the London Convention requires parties to enact national laws to provide a basis for their permitting system and to prevent dumping of wastes and other substances into the marine environment in contravention of the Convention. They are authorized to enact more stringent regulations in their national laws and may prohibit dumping of substances that the Convention permits.
52. Parties to the London Convention have adopted a range of important resolutions banning incineration at sea, dumping of low-level radioactive wastes at sea and establishing a process of phasing out dumping of all industrial wastes at sea, among other changes.
53. In 1996 a new Protocol to the London Convention was adopted designed to reduce the practice of waste dumping by introducing waste management and avoidance practices. This Protocol included a new reverse listing that, instead of listing wastes prohibited for dumping, prohibited dumping of all wastes except those specifically listed. The old Annex I "black list" is accordingly replaced by a new Annex 1 "reverse list" of wastes which can be dumped subject to permit. However, the 1996 Protocol has not yet come into force.
54. Regional conventions concerning the dumping of waste have been adopted for the North East Atlantic Ocean (1992) and Baltic Sea (1992), and protocols have been adopted for the Mediterranean (1995), South Pacific (1986), and South East Pacific seas (1989). The North East Atlantic, Baltic and Mediterranean agreements have been revised since 1990 to incorporate the waste management and avoidance approaches of the London Convention's Protocol.

7. Offshore Hydrocarbon and Mineral Recovery

55. UNCLOS article 208(3) expresses a general obligation to prevent marine pollution from offshore activities and to ensure that national measures are no less effective than international measures. In 1979, the IMO adopted a Code for Construction and Equipment of Mobile Offshore Drilling Units. A convention on Civil Liability for Oil Pollution Damage resulting from Oil and Gas Exploration and Exploitation of Seabed Mineral Resources was adopted in 1977 but has not come into force. Regional standards have been adopted in North West Atlantic, where various bilateral agreements have been adopted, especially for dealing with emergencies (e.g., Norway-UK, Canada-Denmark). The various UNEP regional conventions create a general obligation to prevent pollution from offshore activities (e.g., Barcelona Convention article 7) but these are without any detailed content.
56. Currently, deep seabed mining is not a source of marine pollution. Pollution controls concerning activities in the deep seabed area are to be formulated by the International Seabed Authority established in accordance with part XI of the Law of the Sea Convention (UNCLOS article 209). The International Seabed Authority established under the Convention has formulated a Mining Code for deep seabed operations and is developing guidelines for assessment of possible environmental impacts arising from seabed exploration.

8. Regional Seas Agreements

57. UNCLOS requires parties to enter into regional agreements to formulate and establish rules, standards, practices and procedures for the protection of the marine environment, to supplement rules established at the international level (article 197). Framework agreements for protection of the environment have been created in almost every marine region of the world. Ten regional framework agreements have been developed under the UNEP Regional Seas Programme. A legal regime for the North East Atlantic Ocean was developed by regional states prior to the Regional Seas Programme being adopted.
58. The UNEP Regional Seas Programme was initiated in 1974 covering thirteen regions of world's seas involving more than 140 coastal states and territories. They are the Mediterranean Sea, Baltic Sea, Black Sea, Red Sea and Gulf of Aden, West and Central African seas, East African seas,

Caribbean region, South Asian seas, East Asian seas, South Pacific, South East Pacific and North West Pacific Oceans. The Regional Seas Programme involves development of an Action Plan for the protection of the marine environment in each region. These facilitate target setting, regional cooperation and capacity building in pollution control. Plans are regularly reviewed and have evolved to address broader sustainable development concerns for coastal zones. (See also under chapter 11, Hazardous Wastes).

59. The eleven regional conventions currently in force are:
- Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean ("1976 Barcelona Convention"), adopted on 16 February 1976 and entered into force in 1978;
 - Convention on the Protection of the Black Sea against Pollution ("1992 Bucharest Convention") adopted in April 1992 and entered into force in 1994;
 - Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region ("1983 Cartagena Convention") adopted in 1983 and entered into force in 1986;
 - Convention on the Protection of the Marine Environment of the Baltic Sea Area ("1974 Helsinki Convention") adopted in 1974 and entered into force in 1980;
 - Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment ("1982 Jeddah Convention") adopted on 14 February 1982 and entered into force on 20 August 1985;
 - Kuwait Regional Convention for Cooperation on the Protection of the Marine Environment from Pollution ("1978 Kuwait Convention") adopted in 1978 and entered into force in 1979;
 - Convention for the Protection of the Marine Environment and Coastal Area of the South-East Pacific ("1981 Lima Convention") adopted in 1981 and entered into force in 1986;
 - Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region ("1985 Nairobi Convention") adopted in 1985 and entered into force in 1986;
 - Convention for the Protection of Natural Resources and Environment of the South Pacific Region ("1986 Noumea Convention") adopted in 1986 and entered into force in 1990;
 - Convention for the Protection of the Marine Environment of the North-East Atlantic ("1992

Unlike many of the regional seas agreements, it applies to the internal waters of parties, that is, not only to the territorial sea, high seas, seabeds and subsoil adjacent to parties in the North-East Atlantic and North Sea region.

69. To meet its objectives, article 2(2)(a) of the 1992 OSPAR Convention obligates parties to apply the precautionary principle. This means that parties are to take measures to prevent marine pollution when there is reason to believe that proposed activities in or near the marine environment may create hazards to human health, interfere with legitimate uses of the waters, or harm the living organisms in the waters, even if there is no conclusive evidence that these adverse impacts will definitely occur. Another unique feature of article 2 is that it requires parties to apply the polluter pays principle. Parties are to ensure that the cost of measures taken to prevent, control and reduce pollution as well as the cost of any damage resulting from pollution is borne by the person who pollutes the waters. (See also chapter 3 on Principles and Concepts of this Training Manual).
70. In addition, article 2 of the Convention introduces unusually sophisticated controls on land-based pollution using best available technology standards. Parties are required to ensure that their pollution control programmes make full use of best available techniques and best environmental practices to prevent, reduce and control pollution to the fullest extent.
71. Articles 10, 11 and 12 establish an OSPAR Commission made up of representatives of each party. The Commission has decided to allow Non-Governmental Organizations to participate in the development of its Plan and Programme to facilitate pollution control and other measures. In addition, the Convention provides for the establishment of technical and scientific bodies to implement recommended strategies and to conduct monitoring and assessments.

III. National Implementation

72. International legal obligations are implemented nationally through a range of measures, including legislation, policy and administrative measures. Examples of national legislation drawn from different regions are set out below to illustrate the ways that some countries have implemented the various marine pollution principles and conventions.

1. Romania

73. Romania's Act Number 6 of 1993 authorized the implementation of MARPOL at the national level. Romania's Marine Research Institute, which operates under the Ministry of Waters, Forests and Environment Protection, was designated to act as the focal point for matters concerning the Convention. The Ministry of Water, Forests and Environmental Protection is responsible for enforcement of the law. It drafted a Black Sea Environmental Programme for the Romanian shoreline to facilitate prevention of marine pollution and sustainable development of coastal areas. In addition, Law Number 17 of 1990 governs territorial waters, as required under UNCLOS, and Government Order Number 1907 of 1994 deals with discharge of sewage and wastes at harbour facilities and at sea, and Water Law Number 107 of 1996 deals with accidental oil spills. A National Contingency Plan in case of Marine Pollution by Oil was adopted under that law.

2. South Africa

74. To implement the London Convention, South Africa enacted the "Dumping at Sea Control Act" No. 73 in 1980. In 1985, the Act was amended by the "Prevention and Combating of Pollution of the Sea by Oil Amendment Act" No. 59 of 1985. The amended Act contains detailed provisions prohibiting discharge of oil from ships and other vessels into the sea and imposing penalties for violations and requiring vessel operators and owners to report any accidents leading to oil pollution to the responsible authorities so that appropriate remedial action can be taken. The Act also imposes liability for any damage resulting from oil pollution on the person causing pollution. South Africa has actively participated in the activities of the Scientific Group established by the Convention that are aimed at facilitating technical cooperation and building capacity to combat pollution.

3. Australia

75. Australian marine water quality is administered under complex arrangements that share responsibilities between the national and federated state governments. Under the Offshore Constitutional Settlement, the state governments administer marine waters within 3 nautical miles of the coastline and the national government administers waters from 3 nautical miles to 200