

CONTAMINATION BY CRUISE SHIPS

June 2004



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Introduction

Cruise ship tourism has experienced massive growth in the last thirty years. During these three decades, the number of people opting to spend their vacation on board one of these vessels has multiplied by 25 and so, as a result, have any associated problems.

More than 50 companies control almost 300 cruise ships that carry millions of passengers from one point of the planet to another. Some of the most popular tourist destinations are those which, at the same time, are the most sensitive to environmental disturbance. The Caribbean, Alaska, the Mediterranean, the Nordic fiords and the coasts of many small islands are subjected to visits from these giant vessels. Their natural beauty is the attraction, but also their Achilles heel, as these spots are very vulnerable.

Big cruise liners can carry up to 5,000 people, including a crew of more than 1,000, which makes them genuine floating cities. With lengths that exceed 300 metres and gross tonnage of more than 100,000 GRT, onboard facilities include swimming pools, theatres, cinemas, restaurants, shops, saunas, tennis courts, photo processing shops, laundries, dry cleaning and everything a passenger could possibly require during his stay in his floating hotel. But all these activities generate hundreds of tons of waste of every kind, part of which is thrown into the seas and oceans plied by these ships.

International legislation on the processing and dumping of this waste barely regulates the activities of cruise ships, so tonnes of waste end up in the ocean waters, having hardly been treated.

If we were talking about a coastal resort instead of a cruise ship, national and international treaties, agreements and legislation would be far stricter, making it obligatory for any effluent generated to be specially processed to prevent the dangerous dumping of faecal water, greywater, hydrocarbons, heavy metals and other toxic substances. However, cruise ships can dump all kinds of organic waste and untreated water when they are more than four miles out from the coast.

The growing problem caused by this increase in cruise ship traffic all over the world has led to some countries, particularly the most frequently visited ones, to start introducing new regulations to try and curb their impact. However, legislation is sadly lacking when it comes to international waters.

GENERATION OF WASTE ON BOARD A CRUISE SHIP

It is calculated that a cruise ship with a capacity of some 2,000-3,000 passengers can generate some 1,000 tonnes of waste per day (1) which can be broken down as follows:

- 550,000-800,000 litres of greywater
- 100,000-115,000 litres of blackwater
- 13,500-26,000 litres of oily bilge water
- 7,000-10,500 kilos of garbage and solid waste
- 60-130 kilos of toxic waste

This means that the generation of waste per passenger per day comes to at least 300 litres of greywater, 40 of blackwater, 10 of bilge water, 3.5 kilos of garbage and 30 grams of toxic waste.

Taking into account the number of passengers who use cruise ships each year, the amount of waste generated by zone in which these vessels operate (based on data from the year 2000 (2)) would be as follows:

| Zone | Passenger | Greywater | Blackwater | Bilge water | Garbage | Toxic residue | Total |
|-----------------|-------------------|-----------------------|----------------------|--------------------|--------------------|------------------|-----------------------|
| Caribbean | 21.510.142 | 6.453.042.600 | 860.405.680 | 215.101.420 | 75.285.497 | 645.304 | 7.804.480.601 |
| Mediterranean | 6.277.054 | 1.851.119.200 | 251.052.560 | 62.770.640 | 21.960.724 | 188.312 | 2.219.130.436 |
| Alaska | 4.197.332 | 1.259.199.600 | 167.693.280 | 41.973.320 | 14.690.862 | 125.920 | 1.482.802.782 |
| Europe | 3.744.693 | 1.123.407.900 | 149.767.720 | 37.446.930 | 13.106.425 | 112.341 | 1.322.861.316 |
| Bahamas | 3.200.346 | 960.103.800 | 128.013.840 | 32.003.480 | 11.201.211 | 96.030 | 1.131.418.321 |
| Pacific/Mexico | 2.680.934 | 804.290.200 | 107.237.360 | 26.009.340 | 9.303.269 | 80.426 | 947.790.597 |
| Panama Canal | 2.572.444 | 772.033.200 | 102.697.760 | 25.734.440 | 9.007.054 | 77.203 | 909.709.657 |
| South Pacific | 1.155.217 | 346.565.100 | 46.208.680 | 11.552.170 | 4.043.259 | 34.656 | 408.403.865 |
| Canada | 1.107.699 | 332.306.700 | 44.207.560 | 11.076.890 | 3.876.911 | 33.231 | 391.697.292 |
| Trans-Atlantic | 1.015.625 | 304.687.500 | 40.625.000 | 10.156.250 | 3.554.687 | 30.469 | 359.053.908 |
| Bermuda | 989.391 | 298.517.300 | 39.535.840 | 9.803.910 | 3.459.368 | 29.652 | 349.425.070 |
| Hawaii | 887.300 | 267.217.000 | 34.295.600 | 8.573.900 | 3.000.865 | 25.722 | 302.713.087 |
| Africa | 502.773 | 150.831.900 | 20.110.920 | 5.027.730 | 1.759.705 | 15.083 | 177.746.338 |
| South-East Asia | 244.620 | 73.386.000 | 9.784.800 | 2.446.200 | 856.170 | 7.339 | 86.480.609 |
| Far East | 201.582 | 60.474.600 | 8.063.280 | 2.015.820 | 705.637 | 6.047 | 71.265.284 |
| TOTAL | 60.267.242 | 15.077.172.600 | 2.010.289.680 | 502.572.420 | 175.900.344 | 1.507.717 | 17.767.442.761 |

BALLAST WATER

Another problem is that generated by the large quantity of ballast water used by these vessels. It is thought that a typical cruise ship could dump some 70,000 litres of ballast water per day, with the subsequent risk of introducing invasive dinoflagellate species into ecosystems and giving rise to red tides and pathogens. The IMO believes that the dumping of ballast water, which each day carries some 7,000 species from one end of the planet to the other (3), is one of the most serious environmental, health and economic problems generated by maritime traffic.

TYPE OF WASTE GENERATED BY CRUISE SHIPS

| Waste | Origin | Contaminants |
|-------------|---|---|
| Greywater | Showers, washbasins, swimming pools, washing machines, etc. | Phosphates and other nutrients from soap and detergents; chlorine or fluoride from swimming pools and toothpaste; pathogen bacteria and any other potentially damaging substance used in personal hygiene. Greywater also includes any water from the ship's health facilities. |
| Blackwater | Toilets | Faecal water, bacteria, pathogens, organic waste, paper and any other product flushed down the toilet. |
| Bilge water | The motors and turbines that propel the ship and supply energy for other onboard services. | Used oils, various hydrocarbons, etc. |
| Toxic waste | Photographic processes, dry cleaning, paint, pharmaceutical products, dyes, electronic material, etc. | Can contain substances as toxic as TBT (tributyl tin, a paint additive to stop algae formation), PCP (perchloroethylene for dry cleaning), heavy metals from paints and dyes, chemical compounds from drugs, acids and heavy metals from photographic material, light bulbs, fluorescents, batteries, toluene, xylene, benzene, organochlorates in solvents, etc. |
| Garbage | Food and the daily consumption of all kinds of products. | Oil and chlorinated plastics, solid and organic residues, etc. |

With regard to toxic products, a study (4) quantified the daily generation of these products at some 75 litres of chemicals used in photography processing, 7 litres of used paint, 3.8 litres of dry cleaning fluids, 0.65 kilos of fluorescents, 0.3 kilos of batteries and 0.2 kilos of medical waste, as well as some 60 litres of chemicals past their expiry date.

ENERGY CONSUMPTION AND AIR POLLUTION

The fuel consumption of a cruise ship is equivalent to 12,000 vehicles, exacerbated by the fact that the type of fuel used by the majority of these vessels is 50 times more toxic than regular fuel. Big merchant vessels and cruise ships tend to use lower quality fuel to keep costs down, but this is also the most contaminating fuel. This low-quality product is made up of the heavier hydrocarbon residues that are left over following the crude oil refining process to produce higher quality fuels such as petrol or light oils.

A recent article published in the New York Times (5) quantified the air pollution produced by big merchant vessels, such as freighters and cruise ships, as equal to that of 350,000 vehicles, and calculated the levels of leads and sulphurs in these fuels at 3,000 times higher than petrol.

The smoke from burning fuel in cruise ship engines contains suspended particles, sulphurs and carbon and nitrogen oxides including NOx, SO2, CO and CO2 or polycyclic aromatic hydrocarbons (PAHs). (6)

This fuel is not only used to actually move the ship along but also to maintain all the electrical systems of this veritable floating city in operation: lights, refrigeration, air conditioning, nightclubs, shops, vending machines, televisions and a plethora of electrical appliances.

Air pollution is also caused by waste treatment. Part of the waste is incinerated on board, so cruise ships also generate ash and smoke emissions containing toxic substances. As a result of this waste treatment, substances as toxic as polychlorate biphenyls (PCBs), dioxins and furans have been detected in smoke from fuel-burning.

CONTAMINATION BY CRUISE SHIPS

Cruise ship spillage can contain toxic substances, hydrocarbons, organic residue and pathogen agents, the potential impact on sensitive areas of which is considerable. A study carried out in Alaska corroborated that 68 of the 70 samples taken from the effluent of cruise ships using standard treatment systems exceeded the levels of coliforms in faecal water and/or suspended solids (7). Prior to this, another study carried out in the same American state confirmed that concentrations of pathogens in this spillage may exceed federal limits by between 10,000 and 100,000 times (8). High levels of coliforms were also detected in greywater, as well as heavy metals and dissolved plastics (9), something that is particularly worrying given that this kind of waste is not regulated.

The generation of garbage is another pressing problem, as cruise ships produce 24% of the total solid waste generated by world maritime traffic (10). Unfortunately, many ports lack the proper installations to receive and process this and other waste generated by vessels.

A report by the US government revealed that of the 87 indictments for illegal dumping by cruise ships in its waters between 1993 and 1998, 93% included the dumping of hydrocarbons (11). The report also revealed that 69 cruise ships from 42 different companies were chronically involved in illegal dumping, submitting false information or not keeping the required records of dumping and processing. And these illegal dumping practices have continued.

IS IT POSSIBLE TO STOP THIS CONTAMINATION?

The adoption of technologies to considerably reduce the impact of cruise ships on the environment is not only possible but can be achieved at a relatively low cost. Installing systems to treat sewage in these vessels would represent some 2-2.2 million dollars per ship.

To reduce the volume of waste, there are compacting, shredding, dehydrating and pulverising systems already available which make it easier to store and manage waste until it can be optimally treated.

With regard to air pollution, some new ships are already being manufactured with gas turbines which can reduce emissions into the atmosphere by 90%. Proposals have also been made to use less contaminating fuel and to link up to an electrical system when in port to reduce dependency on fuel-burning.

THE PHYSICAL DESTRUCTION OF THE NATURAL ENVIRONMENT

Many of the richest and most varied ecosystems in the oceans, such as coral reefs, have seen the threat to their existence increased by the presence of cruise ships in the places where they can be found.

In addition to climate change, dumping from land, deforestation and abusive and destructive fishing, coral reefs also have to contend with the damage caused by the anchors of recreational vessels and now the enormous anchors of cruise ships (12).

In the Caribbean, the island of Grand Cayman has witnessed the destruction of 1.2 million square metres of coral reef by cruise ship anchors **(13)**; in the Cancun National Park (Mexico), 80% of the coral sea beds have been damaged by these vessels **(14)**; and in areas such as Jamaica and Florida, the coral reefs, which now only have between 5% and 10% of their coral left alive **(15)**, are also being faced with this threat.

Another study carried out in the Caribbean, this time in the Virgin Islands, came to the conclusion that with a single casting of a cruise ship anchor over a coral sea bed, some 190 square metres of coral could be destroyed **(16)**.

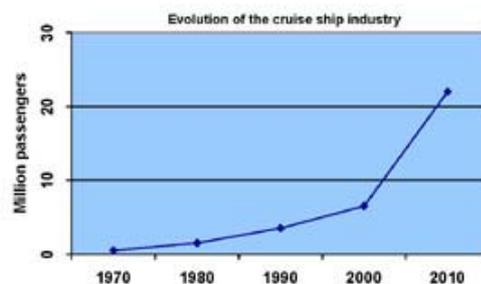
PORTS

Another form of physical destruction that goes hand in hand with the increase in cruise ship traffic is that originated by the construction of facilities for docking and servicing them. Thus new ports have been constructed or existing ones have been extended, dredging sea beds in the process, causing changes to extensive coastal areas and concentrating the spillage of oils and other toxic substances resulting from routine port operations. This has also given rise to high water turbidity due to the suspension of sediments which represents one of the major threats to sea-grass fields and coral reefs, as has been corroborated in Bermuda **(17)**.

THE EVOLUTION OF THE CRUISE SHIP INDUSTRY

Cruise ship tourism is one of the areas that have experienced the biggest growth in the last decades. While international tourism has multiplied by 28 times in the last 50 years (reaching almost 700 million people in 2000 **(18)**), an equal increase has been noted in the number of cruise ship passengers, but this time in just 30 years. While back in the Seventies barely 500,000 people chose cruising for their vacation, today this figure exceeds 12.5 million and possibly even between 13 and 14 million **(19)** (compared to 8.6 million in 2002 and 9.5 million in 2003), generating profits of 17-18,000 million dollars per year **(20)**. Almost 70% of the 50 million people estimated to have sailed on a cruise ship have done so in the last 30 years **(21)**.

Industry forecasts for the cruise ship industry for 2010 indicate that the number of passengers will reach 22 million **(22)**.



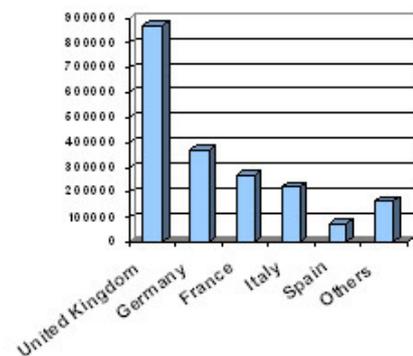
Between 2002 and 2004, the cruise ship industry will have put more than 60 new ships into service **(23)**, including the biggest ship in history, Cunard's Queen Mary II, which went into operation this year. The world cruise ship fleet is thus now approaching 300 ships.

The majority of these vessels are in the hands of the few shipping lines that make up the International Council of Cruise Lines (ICCL) **(24)** which in turn answer to just a few companies. The ICCL includes the 14 major cruise ship lines, which operate 122 vessels (21 Carnival, 9 Celebrity, 10 Costa, 3 Crystal, 4 Cunard, 2 Disney, 13 Holland, 13 Norwegian, 2 Orient, 14 Princess, 6 Radisson, 19 Royal Caribbean, 3 Seabourne, 3 Windstar).

COMPANIES OPERATING IN EUROPE

Following the huge boom in cruise ship travel in North America (which represents nearly 85% **(25)**), it is now expected that Europeans will experience a similar boom in their holiday preferences. There are already 36 cruise ship lines offering services in Europe, with more than 200 ships.

In 2000, there were already around 2,000,000 European cruise ship passengers, the majority of which were British, with 45% **(26)**.



The destination of choice for Europeans continues to be the Mediterranean, although transatlantic cruises have been growing in popularity in recent years. Within European borders, the most frequently visited zones are in the Mediterranean, but other European destinations have experienced an 86% increase in popularity between 2001 and 2002 **(27)**, particularly the Scandinavian coastlines and their fiords, the Baltic, the Atlantic islands, the European capitals and the great rivers.

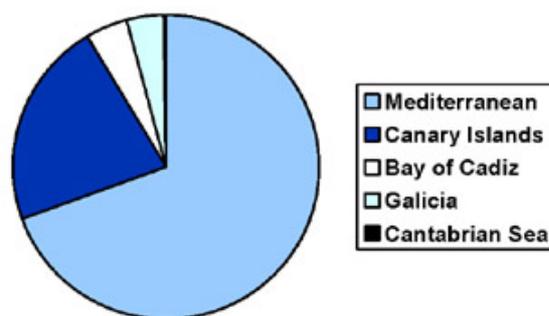
| Company | Fleet | Destinations | | | | | | | | |
|--------------------|-------|---------------|-----------|---------------|---------------------------|-------------------------------|-------------------|---------------------|--------|----------------------------|
| | | Mediterranean | Black Sea | British Isles | Canary Islands and Africa | Iberian peninsula and Islands | European Atlantic | Scandina via/Baltic | Rivers | Other dest. Outside Europe |
| Aida/A`Rose | 6 | | | X | X | X | X | X | X | |
| Carnival | 20 | | | | | | | | | X |
| Celebrity | 9 | X | | X | | X | X | X | | X |
| Costa | 10 | X | X | | X | X | X | X | | X |
| Crystal | 3 | X | X | X | X | X | X | X | | X |
| Cunard | 4 | X | | X | X | X | X | X | | X |
| Disney | 2 | | | | | | | | | X |
| Festival | 4 | X | | | X | X | X | X | | X |
| Fred Olsen | 3 | X | X | | X | X | X | X | | X |
| Hebridean Islands | 2 | X | | X | | | | X | | X |
| Holland | 12 | X | | X | | X | X | X | | X |
| Island | 1 | X | | | | | | | | |
| Louis | 5 | X | | | | | | | | |
| MSC | 4 | X | X | | | X | | | | X |
| Norwegian Coastal | 12 | | | | | | | X | | X |
| Norwegian | 9 | X | | X | | | X | X | | X |
| Ocean Village | 1 | X | | | | | | | | X |
| Orient | 2 | X | | | X | X | X | X | | X |
| Orient-Express | 1 | | | | | | | | | X |
| P&O | 4 | X | X | X | X | X | X | X | | X |
| Page & Moy | 3 | X | | X | | X | | | X | X |
| Peter Deilmann | 10 | | | | | | | | X | |
| Princess | 13 | X | X | X | | X | | | | X |
| Radisson | 5 | X | X | X | X | | X | X | | X |
| Royal Caribbean | 19 | X | | X | | | X | X | | X |
| Royal Olympia | 6 | X | X | X | X | X | X | X | | X |
| Seabourn | 3 | X | | | | X | X | X | X | X |
| Seadream | 2 | X | | | | | | | | X |
| St. Helena | 1 | | | | X | | | | | X |
| Star | 2 | | | | | | | | | X |
| Sun | 3 | X | X | | X | X | X | X | | X |
| Swan Hellenic | 1 | X | | X | | | X | | | X |
| Travel Renaissance | 27 | | | | | | | | X | |
| Thomson | 2 | X | X | | X | X | | | | |
| Windstar | 3 | X | | | | X | X | | | X |

CRUISING IN SPAIN

Spain has not been left on the sidelines with regard to cruise ship tourism. Although the most frequently visited ports are those in the traditional summer vacation areas, such as the Mediterranean and the Canary Islands, destinations on the Atlantic and Cantabrian coasts are increasingly popular destinations (28).

| Port | Passengers |
|----------------|------------------|
| A Coruña | 25.247 |
| Alicante | 25.999 |
| Almería-Motril | 21.160 |
| Algeciras | 78 |
| Cádiz | 114.668 |
| Baleares | 774.423 |
| Barcelona | 834.659 |
| Bilbao | 8.089 |
| Cartagena | 14.680 |
| Ceuta | 4.716 |
| Huelva | 273 |
| Las Palmas | 275.312 |
| Málaga | 162.803 |
| Melilla | 360 |
| Tenerife | 341.146 |
| Santander | 1.754 |
| Sevilla | 1.267 |
| Tarragona | 5.730 |
| Valencia | 48.404 |
| Vigo | 73.316 |
| Vilagarcía | 5.919 |
| <i>Total</i> | <i>2.740.003</i> |

Breakdown of passengers by destination



ROYAL CARIBBEAN CRUISE INTERNATIONAL (RCCL)

Royal Caribbean Cruises Ltd. is one of the biggest cruise ship companies in the world. It operates two cruise ship lines that control more than 25% of the North American market: Royal Caribbean International, Celebrity Cruises and Royal Celebrity Tours. Pending the acquisition of least 3 new ships, the Royal Caribbean Cruise International fleet comprises 28 cruise ships with a capacity to carry 67,576 passengers.

In 2002, the company recorded sales of 3,400 million dollars with a net income of 351.3 million dollars, 28% more than the previous year. RCCL, through its two cruise ship lines, offers trips to Alaska, Canada/New England, the Caribbean, Mexico, the Panama Canal, Transatlantic cruises, the Mediterranean, the Black Sea, the British Isles, Scandinavia/Norwegian Fiords, the North Sea, the Baltic, Brazil, Madeira, North Africa, the Iberian coast, etc.

| Name of ship | Flag | Year | GRT | Passengers |
|--------------------------------|---------------|------|--------|------------|
| ROYAL CARIBBEAN CRUISES | | | | |
| ADVENTURE OF THE SEAS | Bahamas | 2001 | 137276 | 3.114 |
| BRILLIANCE OF THE SEAS | Bahamas | 2002 | 90090 | 2.501 |
| ENCHANTMENT OF THE SEAS | Noruega (NIS) | 1997 | 74136 | 2.446 |
| EXPLORER OF THE SEAS | Bahamas | 2000 | 137308 | 3.114 |
| GRANDEUR OF THE SEAS | Bahamas | 1996 | 73817 | 2.446 |
| JEWEL OF THE SEAS | Liberia | 2004 | 90090 | 2.501 |
| LEGEND OF THE SEAS | Bahamas | 1995 | 69490 | 2.076 |
| MAJESTY OF THE SEAS | Noruega (NIS) | 1992 | 73937 | 2.744 |
| MARINER OF THE SEAS | Bahamas | 2003 | 138279 | 3.114 |
| MONARCH OF THE SEAS | Noruega (NIS) | 1991 | 73937 | 2.744 |
| NAVIGATOR OF THE SEAS | Bahamas | 2002 | 138279 | 3.114 |
| NORDIC EMPRESS | Bahamas | 1990 | 48563 | 2.020 |
| RADIANCE OF THE SEAS | Bahamas | 2001 | 90090 | 2.501 |
| RHAPSODY OF THE SEAS | Noruega (NIS) | 1997 | 78491 | 2.435 |
| SERENAIDE OF THE SEAS | Bahamas | 2003 | 90090 | 2.501 |
| SOVEREIGN OF THE SEAS | Noruega (NIS) | 1987 | 73192 | 2.852 |
| SPLENDOUR OF THE SEAS | Noruega (NIS) | 1996 | 69130 | 2.076 |
| VISION OF THE SEAS | Bahamas | 1998 | 78340 | 2.435 |
| VOYAGER OF THE SEAS | Bahamas | 1999 | 137276 | 3.114 |
| CELEBRITY CRUISES | | | | |
| CENTURY | Bahamas | 1995 | 70606 | 1.750 |
| CONSTELLATION | Bahamas | 2002 | 90280 | 1.950 |
| GALAXY | Bahamas | 1996 | 76522 | 1.870 |
| HORIZON | Bahamas | 1990 | 46811 | 1.354 |
| INFINITY | Bahamas | 2001 | 90228 | 1.950 |
| MERCURY | Bahamas | 1997 | 76522 | 1.870 |
| MILLENNIUM | Bahamas | 2000 | 90228 | 1.950 |
| SUMMIT | Bahamas | 2001 | 90280 | 1.950 |
| ZENITH | Bahamas | 1992 | 47255 | 1.374 |

LEGISLATION ON WASTE GENERATED BY CRUISE SHIPS

A large proportion of international legislation on the dumping of waste at sea by vessels was made during the decades when cruise ships were a quite inconsequential part of the bulk of merchant marine traffic, and carrying passengers was merely an accessory activity to the transportation of merchandise. For this reason, the growth of the cruise ship industry has taken place peripherally and without a parallel evolution in legislation. At the same time, any such agreements are less stringent in international waters. In addition, the majority of the world cruise ship fleet sails under "flags of convenience" which makes it difficult to apply legislation.

The MARPOL convention for the prevention of marine pollution from ships is the international framework within which the regulations on dumping from ships in the seas and oceans can be found. The treaty has 6 annexes which relate to:

ANNEX I: Prevention of pollution by oil (in force since 2 October 1983)

The total amount of hydrocarbons (oily waters, crude, bilge water, used oils, etc.) that is allowed to be dumped by a ship at sea cannot exceed 1/15000 of the total ship's cargo; additionally, the dumping may not exceed 60 litres per mile sailed and may not be carried out within 50 miles of the closest coastline. A register must also be kept on board to record what dumping has been carried out as well as the oily waste deposited in port installations for processing.

ANNEX II: Control of pollution by noxious liquid substances (6 April 1987)

This regulates some 250 different substances that are prohibited from being dumped at sea and can only be deposited in special treatment facilities on land. In whatever circumstances, the dumping of any harmful substance is prohibited within 12 miles of the coastline.

ANNEX III: Prevention of pollution by harmful substances in packaged form (1 July 1992)

This is an optional annex, so many governments do not apply it. It regulates the standards of packaging, labelling, storage methods and documentation that should apply to packaged hazardous substances transported by sea.

ANNEX IV: Prevention of pollution by sewage from ships (27 September 2003)

This annex refers to faecal waters and leaves it up to administrations to establish the acceptable levels of contaminants in dumping. It establishes that treated and disinfected waters may be dumped at a distance of over 4 miles from the coastline and untreated water at no less than 12 miles when the ship is sailing at more than 4 knots.

ANNEX V: Prevention of pollution by garbage from ships (31 December 1988)

This prohibits the dumping at sea of plastics and establishes the zones and the distance from the coast where certain garbage dumping may take place, such as food remains, glass, etc.

ANNEX VI: Prevention of air pollution from ships This annex has not even gone into effect yet due to lack of ratification, as it needs at least 15 states to ratify it whose combined fleets represent at least 50% of the world fleet.

For some zones, which are regarded as "special areas" due to their ecological characteristics, stricter criteria on waste dumping have been established in certain MARPOL annexes.

The same applies to areas classified as "particularly sensitive sea areas" which include the Australian Great Barrier Reef (established in 1990); the Cuban Sabana-Camagüey archipelago (1997), the Colombian island of Malpelo (2002), the area around the Florida cays in the United States (2002), the Wadden Sea between Denmark, Germany and Holland (2002), the Paracas National Reserve in Peru (2003), the Spanish Canary Islands (2004), the Ecuadorian Galapagos Islands archipelago (2004) and the Baltic Sea, with the exception of Russian waters (2004).

| Special Area | MARPOL Annexes | | | |
|-------------------------------|----------------|----|----|----|
| | I | II | IV | VI |
| North-west European waters | X | | | |
| Antarctic | X | X | X | |
| The gulf areas (Persian Gulf) | X | | X | |
| Gulf of Aden | X | | | |
| Baltic Sea | X | X | X | |
| Caribbean Sea | | | X | |
| North Sea | | | X | X |
| Mediterranean Sea | X | | X | |
| Black Sea | X | X | X | |
| Red Sea | X | | X | |

BALLAST WATER

The dumping of ballast water still has no international regulation in force as, despite the fact that in 2004 the International Maritime Organisation approved a new treaty to legislate this kind of dumping, it still has not gone into effect because it needs to be ratified by governments.

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