

**Coastal and marine areas:
Latin America and the Caribbean**

The key environmental problems facing the coastal and marine areas of the Latin American and Caribbean Region are related to habitat conversion and destruction, pollution produced by human activities and overexploitation of fisheries resources. The underlying causes of these problems are linked to the development of coastal areas for tourism, infrastructure and urbanization, and to the conversion of coastal habitats for uses such as agriculture and aquaculture. In addition to diminished natural productivity of coastal areas, most coastal and offshore fisheries are severely overexploited. These problems are expected to be significantly exacerbated by climate change and sea-level rise (UNEP 2000), particularly in the Caribbean. The state of coastal areas throughout the region is illustrated in the table on the right. Coastal areas that are heavily populated and exploited require intensive management and infrastructure to sustain coastal ecological systems. However, complicating coastal zone management are multiple physical and political jurisdictions dividing ecological boundaries and scales.

Exploitation of coastal and marine resources

The region’s coastal zones are the foundation of its economy and sustainability — 60 of the 77 largest towns are on the coasts, and 60 per cent of the population lives within 100 km of the coast (Cohen and others 1997). Development of residential areas and tourism infrastructure has greatly changed the features of coastal areas in the region. Physical alterations of coastlines due to urban growth and the construction of ports and industrial infrastructure are among the major factors that impact the region’s coastal and marine ecosystems.

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 (WTTC 1993). The direct and indirect effects of tourism on coastal and marine areas can be seen in the increasing conversion of coastal habitats and subsequent impacts. For example, overextraction of ground water by expanding tourism infrastructure results in the intrusion of brackish or

salt water into coastal aquifers, eventually contaminating the groundwater system and coastal soil.

Management status of principal coastal and marine areas

<i>Conditions of use</i>	<i>Management and infrastructure support</i>	<i>Biogeographical zones</i>
Intensively used and heavily populated coastal areas Intensive fishing pressure from both coastal populations and offshore fisheries High density or concentration of oil terminals, ports and shipping lanes	Intensively managed – high infrastructure support – regulatory, conservation and education efforts	Some areas of the tropical northwestern Atlantic, including Cancun, Mexico. Southeast Atlantic: Brazil
	Moderate management – regulatory efforts with limited enforcement, limited conservation and education efforts	Most areas of the tropical northwestern Atlantic, such as Puerto Rico, parts of US Virgin Islands, Barbados and most islands of the Lesser Antilles Warm temperate northeastern Pacific, including Mexico Galapagos Islands
	Little to no region-wide management	Most areas of the tropical eastern Pacific, warm temperate southwestern Atlantic, including Argentina, Brazil, Uruguay Some areas of tropical eastern Pacific
Moderately used coastal resources	Intensively managed	Areas of the warm temperate southeastern Pacific, including Peru and Chile — especially those related to coastal shelf fisheries
	Moderate management	Cold temperate South America, including Chile and Argentina
	Light management	Tropical southwestern Atlantic: Brazil
Lightly used coastal resources	Intensive management	Only a few examples of lightly used, intensive management in high profile remote marine protected areas
	Moderate management to little to no management	Very few areas under this category — even large, remote areas such as the Orinoco River delta are affected by land use alterations in the delta and upland watershed areas, even though use of the estuarine resources may be low Also Juan Fernandez and Desventuradas Islands

Pollution

Pollution is mainly caused by discharge of municipal and industrial solid waste and wastewater, run-off from agricultural fields, and maritime transport (especially of hazardous substances), as well as oil and gas extraction, refining and transport. Regional capacity for wastewater treatment is low; some 98 per cent of domestic wastewater is discharged into the northeast Pacific and 90 per cent into the wider Caribbean without treatment (UNEP 2001).

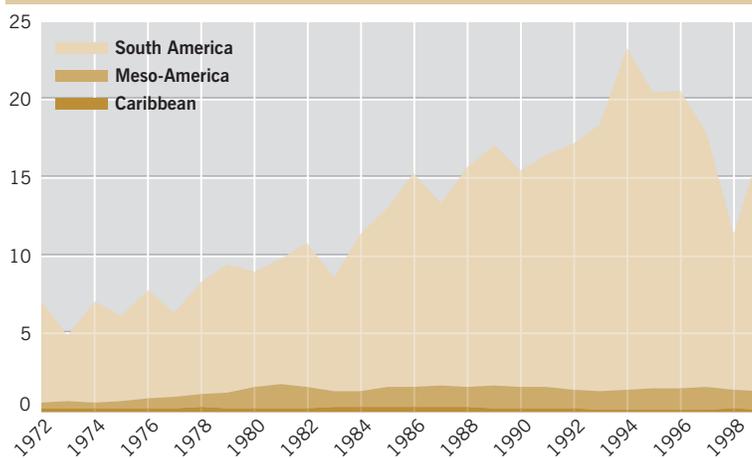
The effects of pollutants from land-based activities are exacerbated in large watersheds, and in turn may affect distant states. The transboundary effects of five major watersheds are especially notable: the Mississippi, the Amazon, the Plata, the Orinoco and the Santa Marta. Satellite images have shown large sediment discharges from coastal rivers and some large islands travelling across thousands of kilometres

of ocean. During a fish kill episode in the Windward Islands in February 2000, pathological bacteria were detected that previously had been reported only in continental freshwater systems (Caribbean Compass 1999). It was suggested that the pathogens had been transported in sediments originating in floods in the Orinoco basin.

Maritime transport is a significant source of coastal and marine pollution in the region especially the release of oil through dumping of bilge water and

distribution systems. The world's largest recorded oil spill was the Ixtoc submarine oil blow-out in the Bay of Campeche, Mexico, on 3 June 1979 with a total estimated outflow of oil greater than the volume from the *Exxon Valdez* spill. In 1999 and 2001, significant coastal spills and pipeline ruptures in Brazil and Colombia caused both active public concern and new restrictions to control future spills. All oil and gas exploration operations have the potential to cause severe damage to the coastal and marine environment as a result of large and small spills, and chronic leaks.

Fish catch (million tonnes): Latin America and the Caribbean



Regional fish catch peaked in 1994 but collapsed later as a result of a strong El Niño event

Note: includes inland fisheries but excludes molluscs, crustaceans and aquaculture

Source: compiled from Fishstat 2001

tank rinsing. Other threats from maritime transport include discharge of sewage, garbage and hazardous chemicals, and introduction of exotic or invasive species to new areas through loading and off-loading of ballast water.

The ports in the region are the second most important destination for containerized goods from the United States, and the Panama Canal is a principal link for global maritime trade. Between 1980 and 1990, maritime transport in the region increased from 3.2 to 3.9 per cent of global trade, and significant increases are expected to continue as a result of trade liberalization and privatization of regional ports (UNCTAD 1995). Without counter measures, environmental problems related to maritime transport are expected to worsen in the future.

The marine and coastal areas of Latin America and the Caribbean are among the most productive petroleum-producing areas in the world. The most important pressure on the marine and coastal environment in specific localities is the risk of oil spills from oil and gas exploration, production and

Fisheries

Overexploitation of fisheries resources and the problems of by-catch and discards have become features of the regional fisheries regime. The catch from the region's seas has generally increased over the past 30 years (see figure). Total fish catch (including inland fisheries but excluding molluscs, crustaceans and aquaculture) reached a regional peak of more than 23 million tonnes in 1994 (nearly 30 per cent of the global total). From 1985 to 1995, many South American countries doubled or tripled their catch, and Colombia's catch increased five-fold. However, in 1998 the regional catch dropped considerably to 11.3 million tonnes (15.9 per cent of the global total), due to adverse climatic factors caused by the El Niño.

A recent study that established geographic priorities for marine conservation in the Central Caribbean ecoregion indicated that excessive exploitation was a threat in 34 of the 51 local production systems (Sullivan and Bustamante 1999). The region also faces the problem of large quantities of by-catch and discards that include turtles, marine mammals, marine birds and other smaller but ecologically important species. At present, the region has no system to record indicators on the health of resources and ecosystems that would gear actions to the recovery of overexploited species and their environment (UNEP 2001).

Measures to halt overexploitation of fisheries have been implemented in some countries. In January 2000, the Government of the Bahamas and local NGOs agreed to the establishment of five 'No Take' marine reserves near the offshore islands of Bimini, Berry, South Eleuthera, Exuma and northern Abaco. The objective is to establish, with full community participation, a complete system of such reserves, to

aid in the prevention of overfishing and loss of marine biodiversity. This would result in the protection of 20 per cent of the coastal and marine environment (NOAA 2001).

Policy responses

International policy responses to the problems described above have been many and varied. Most of them are based on fisheries conventions, international shipping conventions, or the large number of agreements tied to the United Nations Convention on the Law of the Sea. At the same time, 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.

The following are among the most important multilateral agreements and action plans:

- The Convention on the Protection and Development of the Marine Environment of the Wider Caribbean ('The Cartagena Convention') (1983) and its protocols (on oil spills and protected areas and land-based pollution).
- UNEP's Regional Seas Programme, and the international project for the elimination of barriers to implement ballast water controls and management measures for developing countries, proposed for the period 2000-2002 by the International Maritime Organization (IMO).
- The International Coral Reefs Action Network (ICRAN), an important effort to halt the degradation of coral reefs, which is supported by the United Nations Foundation (UNF).
- The Caribbean Planning for the Adaptation of Global Climate Change (CPACC) project which



assists the 12 Caribbean CARICOM countries to prepare for the negative impacts of possible global climate change, especially with respect to the rise in sea level, by measuring their vulnerability and planning for the adaptation and development of their capacity to deal with the problem.

Few of the conventions mentioned, however, have been in force long enough, and with adequate established infrastructure, to assess their strengths and weaknesses. It is clear, however, that regional environmental monitoring processes need to be geared to assessing environmental conditions as well as monitoring implementation activities designed to restore sustainability of coastal and marine areas and their resources.

Capacity for wastewater treatment is low; 98 per cent of domestic wastewater is discharged into the northeast Pacific and 90 per cent into the wider Caribbean without treatment

Source: UNEP, David Tapia Munoz, Topham Picturepoint

References: Chapter 2, coastal and marine areas, Latin America and the Caribbean

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