GUIDELINES FOR THE REGIONAL INTEGRATED COASTAL ZONE MANAGEMENT PROGRAM OF THE GULF OF MEXICO AND THE CARIBBEAN

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INTRODUCTION

The Gulf of Mexico extends over an area of 1,602,000 km^2 and is an oceanographic unit forming part of the Wider Caribbean Region. It is considered to be the largest protected water basin in the Atlantic Ocean. The Exclusive Economic Zones of the United States of America, Mexico and Cuba converge in the Gulf. On the international arena it is considered one of the 50 Large Marine Ecosystems that must be protected and used in a manner that optimizes the economic and environmental resources derived from the utilization of its natural resources (Kumpf *et al.* 1999; Zárate *et al.* 1999; Yáñez-Arancibia and Day 2003).

The Mexican coastal zone of the Gulf of Mexico and Caribbean is 3,118.71 km long (30% of the national total). It is shared by the states of Tamaulipas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo, which have coastlines facing the great international boundary adjacent to the Caribbean Basin, where Mexico interacts with 35 governments or countries.

Mexico shares a continental drainage basin of more than 5,180,000 km^2 in the Gulf of Mexico with four other countries: Canada, U.S.A., Cuba and Guatemala. Of the above-mentioned area, 783,915 km^2 belong to Mexico (Weber *et al.* 1992). The continental shelf has an area of 480,000 km^2 (Zárate *et al.* 1999).

The coastal and marine zone of the Gulf of Mexico and the Caribbean is a region of great ecological value for Mexico due to its great diversity of ecosystems, habitats, natural resources and plant and animal species. From the social and economic standpoint these ecosystems and resources provide goods and services that are strategic for the country, because they allow the development of economic endeavors of which some of the most important include hydrocarbon extraction, processing and distribution, and industrial, port, commercial, agricultural and tourism activities (Botello *et al.* 1996; Toledo 1996; Zárate *et al.* 1999, 2003; Rivera-Arriaga and Zárate 2000). Tables 31.1 and 31.2 show a summary of the strategic importance of the region, as well as the environmental goods and services provided by its ecosystems.

The objectives of this chapter are to underscore the great ecological and socio-economic value of the Mexican coastal zone of the Gulf of Mexico and the Caribbean, its most critical environmental problems, issues and needs related to legal and institutional frameworks, and the policies and instruments employed for its administration and management. The chapter has the objective of proposing the terms of reference and main components for the establishment of an integrated management program for the coastal zone of the Gulf of Mexico and the Caribbean.

CRITICAL ENVIRONMENTAL PROBLEMS

This region's coastal zone is directly exposed to the environmental impact of human activities carried out in the six coastal states, which cover an area of 318,828 km^2 (16.2% of the national total), and indirectly exposed to the impact of the anthropogenic activities conducted in the river

Table 31.1. Ecological, social and economic value of the Mexican coastal zone of the Gulf of Mexico and the Caribbean (Toledo 1996; INEGI-SEMARNAP 1999; Lara-Domínguez *et al.* 2003; Zárate *et al.* 1999, 2003; PEMEX 2000).

Ecological value
• Includes the river basins with the country's largest fluvial discharge (62% of the national total).
• The Grijalva-Usumacinta system is considered the largest fluvial discharge system in Mexico (59.4×10^9 m^3/year) and the third largest in all of North America after the Mississippi and the Atchafalaya rivers.
• There are at least 37 lagoon and estuarine ecosystems covering an area of 678,608 ha (43% of the national total).
• Laguna de Términos in Campeche is considered the most important lagoon-estuarine ecosystem in the country due to its area (200,108 ha), natural productivity and biodiversity (over 2,000 plant and animal species).
• There are 423,237 ha of mangrove in the coastal zone, representing 59% of the total mangrove area in the country.
• There are 1,229,231 ha of freshwater marshes on the coastal plain.
• The wetlands associated with Laguna de Términos Lagoon and Petenes in Campeche, in addition to those located in the Centla Marshes in Tabasco, cover an area of 949,000 ha. They are considered the most important wetlands in Mesoamerica due to their high productivity and biodiversity.
• More than 673 species of birds, 249 of terrestrial mammals, 24 of marine mammals and 329 of fish use this region's wetlands and coastal lagoons as critical habitats during their life cycles.
• The coral reefs of Quintana Roo are part of the Belize Reef System, considered the most important of the Caribbean Region and second in the world.
• The Banco Chinchorro in Quintana Roo and Arrecife Alacrán in Yucatán are considered the two most important atolls in the Caribbean.
• There are 19 federal protected natural areas covering a surface of 3,045,318 ha (54% continental and 46% marine).
Socio-economic value
• 14,756,759 people live in the region's coastal states.
• Two of the major oil provinces in the Western Hemisphere, Reforma-Tabasco and Campeche Bay, are located in the region.
• A total of 2.9 million barrels of oil and 4,790 million cubic feet of natural gas are extracted daily from the coastal and marine zone. Total hydrocarbon reserves for the region amount to 58 billion barrels of oil, of which 58% are proven reserves.

Table 31.1. Continued

Ecological value
• The coastal and marine zone has the following oil infrastructure: 313 production fields, 4,269 exploitation wells, 167 marine platforms, 2 refineries, 9 gas-processing centers and 6 petrochemical complexes. • Fishing activities involve over 90,000 people • More than 350,000 tons of demersal fisheries resources are caught annually (26% of the national total), with an approximate value of 240 million dollars. Fifty percent of the nation's shrimp catch and 90% of its oyster catch are obtained in the Gulf of Mexico. Other important fisheries resources include clams, lobsters, crabs, octopus, groupers, snappers, sea trouts, snooks, pompanos and sharks. • There are 20 fishing ports in the region, such as Tampico, Tamiahua, Tecolutla, Veracruz, Sánchez Magallanes, Frontera, Ciudad del Carmen, Lerma and Yucalpetén. • 54 fishing, tourism, industrial and commercial ports are located on the coast (13 of which are deep water ports). These ports have more than 75,000 linear meters of docking and annual traffic of over 1.5 million passengers and 133 million tons of freight (79% of the national total). • There are 59,634 m of breakwaters, seawalls, jetties and other protective structures with the objective of protecting the coastline (46.4% of the national total). • Tourism facilities include 1,794 establishments and 71,254 hotel rooms, accounting for 22% of the national total. • Of the five fully planned tourism beach centers in Mexico, Cancún, in Quintana Roo offers 66% (21,802 hotel rooms) of the country's total. In the year 2000 the state of Quintana Roo captured 2,809 million dollars in foreign funds (34% of the nation's total) as a result of tourism.

basins draining towards the coast, which extend over an area of 783,915 km^2, i.e., 40% of Mexico's territory (Zárate *et al.* 1999, 2001). Table 31.1 presents the main environmental problems of the region's coastal zone. The following can be considered critical due to their magnitude:

HABITAT LOSS

Fragmentation and loss of ecosystems, plant cover, biodiversity and soils due to the poorly planned development of agricultural, ranching, urban and industrial activities (Botello *et al.* 1996; Day *et al.* 1997; Arriaga *et al.* 1998; Zárate *et al.* 1999, 2003). Only 36% of the primary vegetation currently remains on the surface of the six states in this region and, as can be observed in Figure 31.1, it is very fragmented (Zárate *et al.* 2003). If the change rate in plant cover and land use prevailing for the past 10 years is maintained, the states of Veracruz, Tabasco, Campeche, Yucatan and Quintana Roo will have lost the primary vegetation they still have in periods of 11, 55, 25, 32 and 28 years, respectively, and along with it, the environmental goods and services it provides (Zárate and Alafita 2001). In the six states the plant cover loss and

Table 31.2. Economic and ecological value of environmental assets and services provided by the main ecosystems of the coastal and marine zone of the Gulf of Mexico and the Caribbean. Symbols: † = Direct-use value: environmental assets and services with a market price; ‡ = Indirect-use value: environmental assets and services that have not been assigned a market price, but that have an economic and social value that can be estimated; ¶ = Value with no use/preservation: environmental attributes and assets that have not been assigned a market price, but that have an economic and social value that can be estimated.

Ecological Value	Economic Value Types of Coastal Ecosystems[1]								
	CM	CP	DE	OC	FP	SG	CR	BI	CS
Components									
Forest resources	†	†	†		†			†	
Fishing resources	†	†	†	†	†	†	†	†	†
Wildlife resources	†	†	†	†	†	†	†	†	†
Water resources	†	†	†	†	†	†		†	†
Recreational resources	†	†	†	†	†	†	†	†	
Functions									
Aquifer charge and recharge	‡	‡			‡				
Coastal protection and stabilization	‡			‡		‡	‡	‡	
Retention of sediments and nutrients	‡	‡	‡		‡	‡			
Maintenance of water quality	‡	‡	‡		‡	‡	‡		
External support for ecosystems and human activities	‡	‡	‡		‡	‡	‡	‡	‡
Microclimate stabilization	‡	‡	‡						
Critical habitats	‡	‡	‡		‡	‡	‡	‡	‡
Features									
Biodiversity	¶	¶	¶	¶	¶	¶	¶	¶	¶
Uniqueness and heritage	¶	¶	¶	¶	¶	¶	¶	¶	¶

[1] CM = Coastal marshes; CP = Coastal plain; DE = Deltas and lagoon-estuarine systems; OC = Open coast, bays and beaches; FP = Floodplains; SG = Seagrasses; CR = Coral reefs; BI = Barriers and islands; CS = Continental shelf.

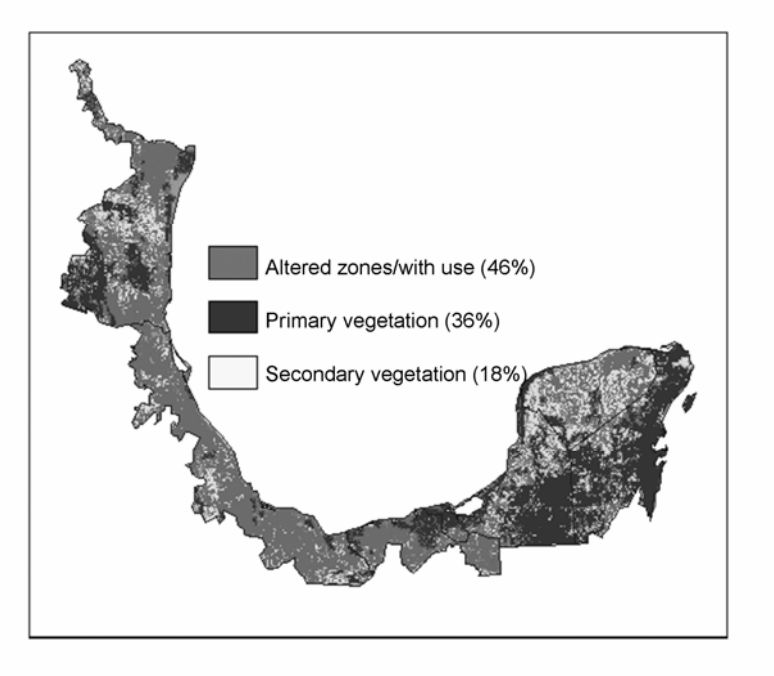

Fig. 31.1. Conservation status of Mexican states on the Gulf of Mexico and the Caribbean.

other factors have induced desertification, water and wind erosion in 314,114 km^2, 316,114 km^2 and 308,148 km^2 of their land areas, respectively (INEGI-SEMARNAP 1999).

POLLUTION OF THE COASTAL AND MARINE ZONE

Several regional studies have stressed the critical levels of water, sediment and organism contamination by hydrocarbons, agrochemicals, heavy metals and microorganisms recorded in this region's different ecosystems, which exceed the maximum permissible limits established in national and international standards (Botello *et al.* 1996; Arriaga *et al.* 1998; Zárate *et al.* 1999; INE-SEMARNAP 2000). The main reasons for this are lack of environmental planning, sanitation infrastructure and urban services. For example, in Quintana Roo only 15% of the population has sanitary drainage services, 15% has wastewater treatment and 8% is supplied with sanitary landfills (GSTP-SEDUMA 2002). The situation is quite similar in the other states of the region. In summary, pollution levels and trends in this region's coastal ecosystems are critical and, if maintained, can seriously jeopardize these ecosystems' stability and permanence.

EFFECTS OF NATURAL EVENTS

Effects on the population, infrastructure and economic activities caused by natural phenomena and hazards. The region is characterized by a series of natural processes and phenomena such as: a) subsidence due to sediment accumulation and compaction in deltaic zones; b) coastal deposition and erosion; c) salinization of continental soils and water; d) incidence of hydrometeorological events; and e) global effects of climate change and sea level rise (Ortiz *et al.* 1996). These processes are rarely considered when planning production

activities, human settlements and infrastructure, which has led to the loss of human lives, infrastructure and important economic resources. Examples of areas at risk due to sea level rise at some selected sites on the coastal zone of the Gulf of Mexico and the Caribbean are shown in Figures 31.2 and 31.3 and Table 31.3.

LEGAL CONSIDERATIONS

As can be observed in Figure 31.4 and Appendix 31.1, there are many legal and juridical instruments at both the federal and state levels, which directly and/or indirectly affect the management and administration of the coastal zone and its resources. Nevertheless, the minimum enforcement and compliance by all the sectors involved, as well as the lack of normatization, supervision and management with an ecosystems-based vision, has contributed to the growing deterioration of this region's coastal and marine zone, as well as the loss of important natural resources.

In addition to its national juridical framework, Mexico has participated in and committed to a large number of international agreements and treaties related to the administration and management of the coastal and marine zone (see Appendix 31.2). However, compliance and results of those commitments have been very limited.

Due to all of the above and considering the great diversity of resources, ecosystems, problems, users and sectors involved with this region's and the country's coastal zones, it is urgent to envision two scenarios: a) to adapt, strengthen and complement the current legal-normative framework applicable to the coastal zone; and b) to define a specific legal instrument for this ecogeographic space, such as a law for the management of this coastal zone. Both scenarios should be geared towards integrating and harmonizing the different laws and regulations, as well as the responsibilities and attributions of governmental institutions at all levels and, in general, of all players involved in the use, administration and management of the coastal zone and its resources (Zárate *et al.* 1999).

INSTITUTIONAL FRAMEWORK

The Secretaría del Medio Ambiente y Recursos Naturales (SEMARNAT; Secretariat of Environment and Natural Resources) is responsible for Mexico's environmental policies and programs and, therefore, the management and administration of its coastal zone. However, a great number of other entities at the federal, state and municipal levels participate in the use and management of the coastal zone (Figure 31.4). From an institutional standpoint there are three important problems for the efficient use and management of the coastal zone at the national and regional levels (Zárate 2003):

- SEMARNAT has not defined a national or regional policy, program or instrument that can guide the development of an integrated management of this coastal region.
- The various federal, state and municipal governmental sectors that influence the use and management of coastal resources generally determine their development policies and programs without considering environmental criteria or the strategic importance and fragility of this region's coastal ecosystems. This originates severe environmental problems, overlapping of functions and conflicts of interest.

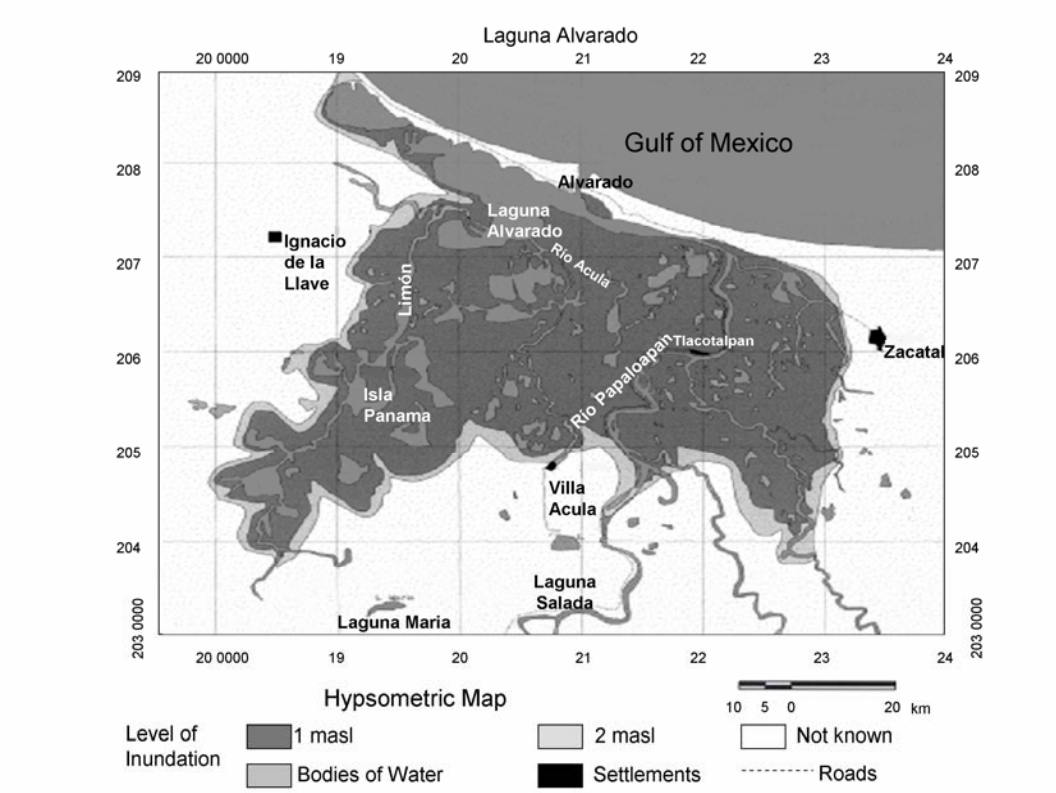

Fig. 31.2. Areas at risk and vulnerable to flooding and saline intrusion in the deltaic zone of the Río Papaloapan due to sea level rise. masl = meters above sea level

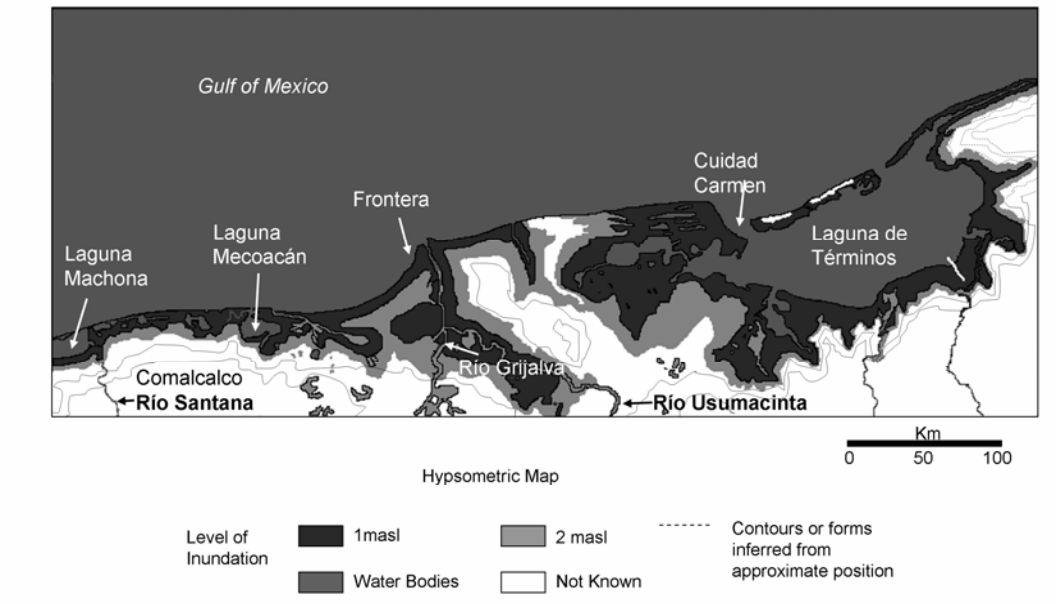

Fig. 31.3. Areas at risk and vulnerable to flooding and saline intrusion in the deltaic zone of the Grijalva-Usumacinta river system due to sea level rise. masl = meters above sea level

Table 31.3. Areas at risk and vulnerable to flooding and saline intrusion in the deltaic zone of the Río Papaloapan due to sea level rise. States: TAM = Tamaulipas; VER = Veracruz; TAB = Tabasco; CAM = Campeche; YUC = Yucatán; QR= Quintana Roo. Symbols: † = small impact; ‡ = important impact; ¶ = very important impact.

Sources and Types of Environmental Impacts	TAM	VER	TAB	CAM	YUC	QR
Oil Activities						
Air, water, soil and biota contamination by accidental hydrocarbon spills and the generation of solid, liquid and gaseous waste derived from hydrocarbon extraction, processing, transportation and distribution	‡	¶	¶	¶	†	‡
Hydrological alterations and ecosystem fragmentation by the construction of canals, ducts, dirt roads, communication routes, bridges and other structures	‡	¶	¶	¶	†	‡
Ecosystem fragmentation and changes in land use due to the construction of infrastructure	¶	¶	¶	¶	†	†
Water consumption and contamination by production processes	‡	¶	¶	†	†	†
Port and Industrial Activities						
Water, sediment and biota contamination by liquid and solid wastes generated in ports, marinas and industrial zones	¶	¶	†	‡	†	†
Physical alteration of sediments and estuarine and marine ecosystems, as well as alterations in sea water quality by dredging and navigation activities	‡	‡	†	‡	†	†
Changes in land use and ecosystem fragmentation	‡	‡	†	‡	†	‡
Water consumption and contamination in production processes	‡	¶	¶	†	†	†
Aquaculture and Fisheries Activities						
Mechanical and physical alteration of sediments and submerged vegetation on the adjacent continental shelf by trawling	‡	‡	‡	¶	‡	†
Overexploitation of resources	‡	‡	‡	‡	‡	‡
Organic contamination and eutrophication of lagoons and estuaries	†	†	‡	‡	‡	†
Introduction of exotic species	¶	¶	‡	‡	‡	†
Urbanization and Tourism						
Land conversion and ecosystem vegetation fragmentation due to the construction of urban and tourism infrastructure	‡	¶	‡	‡	‡	¶
Water, air, soil and biota contamination by liquid, gaseous and solid waste produced in urban and tourism zones	¶	¶	¶	¶	¶	¶
Hydrological alterations and ecosystem fragmentation by the construction of canals, communication routes, ports and other infrastructure	‡	¶	¶	¶	‡	‡

Table 31.3. Continued

Urbanization and Tourism						
Public health problems due to contact with and consumption of contaminated water and other resources	‡	‡	‡	‡	‡	‡
Water consumption	‡	‡	‡	‡	‡	‡
Agricultural, Ranching and Forestry Activities						
Land conversion and fragmentation of ecosystems and vegetation due to the expansion of the agricultural, ranching and forestry frontier	¶	¶	¶	¶	¶	‡
Soil, water and biota contamination by the use of agrochemicals	¶	¶	¶	¶	†	†
Soil erosion and loss due to deforestation	†	‡	†	‡	‡	†
Hydrological alterations by canalization and irrigation works. Salinization of soils.	¶	‡	¶	¶	†	†
Hazardous Natural Phenomena and Processes						
Coastal erosion and accumulation due to hydrometeorological events	†	‡	†	†	¶	¶
Areas at risk and vulnerable to flooding and saline intrusion due to sea level rise	†	‡	¶	¶	‡	‡
Subsidence due to sediment accumulation and compaction	†	‡	¶	¶	†	‡
Transboundary Activities						
Water, coastal, biota and fisheries resources contamination by hydrocarbons and solid waste produced outside the country and transported by coastal currents and drift.	†	‡	‡	‡	‡	‡

- Certain development sectors have undertaken institutional efforts to address coastal zone issues, but unfortunately such efforts have been established within sectorial visions with no apparent connections between them.

Due to the facts above and increasing environmental deterioration, it is urgent for SEMARNAT to define a strategy or instrument for an Integrated Coastal Zone Management (ICZM) that includes a strengthening of the Secretariat's institutional capacity to attend to these environmental problems, as well as the creation and consolidation of an interdisciplinary group to coordinate, plan and monitor the ICZM.

ENVIRONMENTAL POLICY INSTRUMENTS

NATIONAL DEVELOPMENT PLAN

The problems facing the Mexican coastal zone have historically been approached in a dissociated manner by the public administration. Although there are institutional efforts for an integrated management of this ecogeographical space, they have been established based on sectorial viewpoints (SEMARNAT 2001).

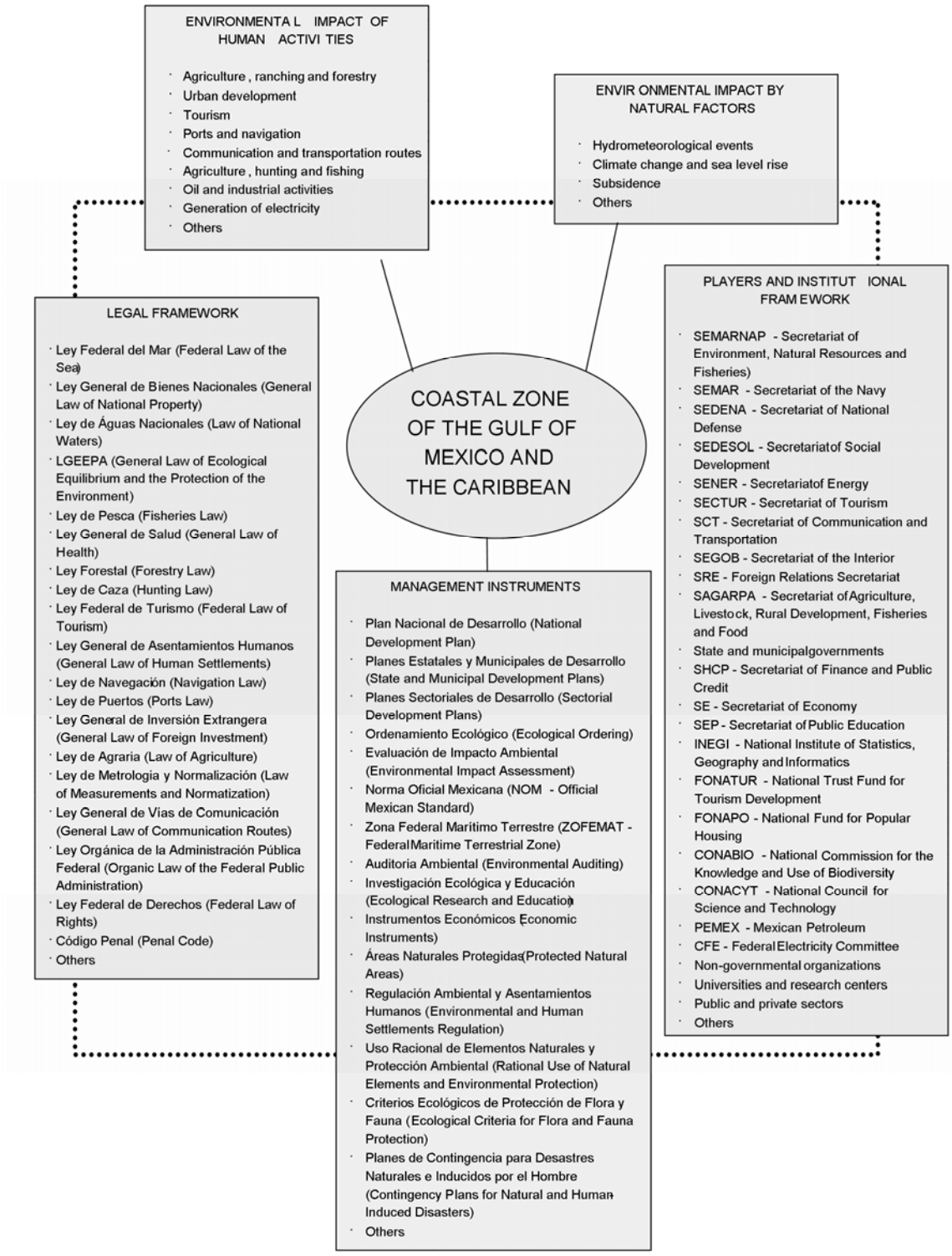

Figure 31.4. Factors and instruments that affect the management of the coastal zone of the Gulf of Mexico and the Caribbean Sea (Zárate *et al.* 1999).

The *2001-2006 Environmental Program* recognizes the strategic importance of the country's coastal zone in terms of ecosystems, resources and environmental assets and services (SEMARNAT 2001). Nevertheless, it fails to define a policy, strategic program or environmental planning and administrative instrument at the national level capable of orienting management with an integrated, multisectorial focus.

The lack of an ad hoc instrument allowing for the coordination of policies and programs that directly or indirectly influence the coastal zone has led to negative effects, such as overlap of functions, conflicts of interests and incompatibility among the different development sectors at the federal, regional, state and municipal levels, as well as high economic costs and significant environmental impacts (Zárate 2003). Therefore, there is a clear and urgent need for the short term definition and implementation of a National Integrated Coastal Zone Management Program and, in the specific case of the region discussed herein, an Integrated Coastal Zone Management Program for the Gulf of Mexico and the Caribbean which allows true integration of policies, as well as ecosystem-focused multisectorial planning (Zárate *et al.* 1999, 2003; Yáñez-Arancibia and Day 2003; Zárate and Yánez-Arancibia 2003).

ECOLOGICAL ORDERING

Despite the fact that Ecological Ordering (EO) is one of the main environmental policy instruments for planning at different scales, there are only six EO programs established for this region, all in Quintana Roo, which has an area of 6,347.20 km^2. This small area represents just 1.75% of the surface covered by the six states located in this region. Comparing this percentage and observing Figure 31.1, it can be concluded that the efforts made towards environmental planning and ordering of the region's coastal zone have been minimal relative to the critical degree of fragmentation of these ecosystems and resources which are strategic for the country.

One of the problems in the areas currently included in EO programs is that their boundaries and zoning lack administrative, scientific, legal and technical criteria that are in accordance with the structure and dynamics of coastal ecosystems and resources, thus restricting the integrated management. Similarly, models for land use and ecosystem and resource management fail to consider their carrying capacity in terms of extraction of resources, loss of plant cover and generation of liquid and solid waste, among others. The absence of permanent regional assessment and monitoring mechanisms that give feedback and allow the update of models for the use of ecosystems and resources defined in the EO programs is another important limiting factor to their application (Zárate 2003).

ENVIRONMENTAL IMPACT ASSESSMENT

Environmental Impact Assessment (EIA) is another of the main environmental policy instruments in Mexico. Despite its importance, it exhibits a series of limitations and weaknesses regarding its application in coastal projects, the most important of which are: a) definition of the zone of influence of the projects; b) identification and assessment of impacts on environmental assets and services; c) lack of economic and social evaluation of environmental impacts; d) scarce evaluation of natural hazards; e) identification and assessment of cumulative, synergistic, and regional impacts; and f) definition and execution of environmental monitoring and surveillance programs (Yáñez-Arancibia *et al.* 1996; Zárate *et al.* 1996, 1999).

The EIA of development plans, policies and programs in Mexico, better known as Strategic Environmental Assessment (SEA), is not contemplated in the Ley General del Equilibrio Ecológico y la Protección al Ambiente (LGEEPA; The General Law of Ecological Equilibrium and the Protection of the Environment), for which reason it is planned and implemented by the public or private sector that develops it (Zárate *et al.* 1996). This is a delicate situation, as there is no assessment of the environmental implications of the multiplicity of projects on the coastal zone, which are characterized by environmental consequences at the regional level. Recent programs conducted by Petróleos Mexicanos (PEMEX; Mexican National Petroleum Company) to explore and extract oil and gas on the coastal and marine zone of the Gulf of Mexico can be mentioned as an example. Questions about these programs are whether they have assessed the environmental implications in their zones of influence, the regional, cumulative, synergistic and transboundary impacts, as well as respective regional measures for mitigation. If the answer is negative, priority must be given to the agreement and performance of the respective SEAs for this and other development programs and policies.

PROTECTED NATURAL AREAS

Protected Natural Areas (PNAs) are one of Mexico's most solid environmental policy tools, because they constitute an indispensable instrument for the protection and conservation of ecosystems and resources. Currently there are 19 PNAs decreed at the federal level in this region, with a total area of 2,977,610 ha, representing 9.3% of the protected area in the six states of the region (Table 31.4). Although this is a considerable area, it does not reflect the current need to protect, conserve and use in a sustainable manner the well conserved coastal areas or ecosystems with large biodiversity that still exist in the coastal zone of this region, but which have not yet been decreed and managed as PNAs at the federal or state level (Figure 31.1).

Some of the most important limitations of this region's coastal PNAs are: a) in some cases the criteria by which their boundaries and zoning were defined do not correspond with structural and functional management of the coastal ecosystems involved; b) poor urban development planning in protected coastal areas increases the pressures by waste generation, loss of plant cover and construction of infrastructure, as well as the *a posteriori* application of mitigation measures; c) industrial and tourism demographic pressure; d) disorganization and lack of regulations regarding access to marine and coastal resources; e) pollution from point and non-point sources; f) conflicts of interests among users (PEMEX, tourism, ports, fisheries industry); g) limited implementation of environmental monitoring programs; h) limited funds for their operation (CONANP 2003).

FEDERAL MARITIME TERRESTRIAL ZONE

Mexico's coastal-maritime zone has been legally defined by its administration and management on the continental part as the Zona Federal Marítimo Terrestre (ZOFEMAT; Federal Maritime Terrestrial Zone), and in the oceanic portion as the Territorial Sea (TS) and Exclusive Economic Zone (EEZ).

The application of the administrative boundaries defined by the ZOFEMAT, TS and EEZ for the purposes of an integrated management, present the problem of not reflecting the natural expanse and limits of the coastal-maritime zone. In the case of the ZOFEMAT, the coastal zone can extend beyond the established limits, and the maritime zone can extend for a shorter distance than the limits established by the TS and EEZ. Due to this and for the effect of the ICZM for this

Table 31.4. Protected natural areas in the coastal-marine zone of the Gulf of Mexico and the Caribbean (INEGI-SEMARNAP 1999; CONANP 2003).

Category	Protected Natural Areas/ States Involved	Area (ha)
Biosphere Reserves	Sian Ka'an Coral Reefs (Quintana Roo)	34,927
	Banco Chinchorro (Quintana Roo)	144,360
	Los Tuxtlas (Veracruz)	155,122
	Centla Marshes (Tabasco)	302,707
	Ría Lagartos (Yucatán)	60,347
	Sian Ka' an (Quintana Roo)	528,148
	Los Petenes (Campeche)	282,858
	Ría Celestún (Yucatán and Campeche)	81,482
	Subtotal (ha)	1,589,951
National Parks	Arrecife Alacrán (Yucatán)	333,767
	Cozumel Reefs (Quintana Roo)	11,988
	Puerto Morelos Reefs (Quintana Roo)	9,067
	Contoy Island (Quintana Roo)	5,126
	Isla Mujeres, Punta Cancún and Punta Nizuc (Quintana Roo)	8,673
	Veracruz Reef System (Veracruz)	52,239
	Tulum (Quintana Roo)	664
	Xcalac Reefs (Quintana Roo)	17,949
	Subtotal (ha)	439,473
Flora and Fauna Protection Areas	Laguna de Términos (Campeche)	705,016
	Uaymil (Quintana Roo)	89,118
	Yum Balam (Quintana Roo)	154,052
	Subtotal (ha)	948,186
Total, Gulf and Caribbean Coastal Zone		2,977,610
Total, all 117 protected areas in the country		12,731,109

region, it is necessary to adjust the current administrative boundaries or propose others according to the coastal zone's structure and dynamics, such as natural borders on the continent and in the ocean where continental and marine processes, respectively, have spatial and temporal influences (Zárate *et al.* 1999).

OTHER INSTRUMENTS

Other instruments defined by the LGEEPA as environmental policy instruments participating directly or indirectly in the use, management and administration of Mexico's coastal zone include: a) Normas Oficiales Mexicanas (NOM; Official Mexican Standard); b) environmental auditing; c) ecological research and education; d) economic instruments; e)

environmental and human settlement regulations; f) rational use of natural elements and environmental protection; and g) ecological criteria for protection of flora and fauna. All these instruments lack an integrated and efficient vision to tend for the environmental problems and management needs of ecosystems and natural resources in the coastal zone of the Gulf of Mexico and the Caribbean.

EFFORTS TOWARDS AN ICZM FOR THE GULF OF MEXICO/CARIBBEAN

BACKGROUND

Various forums and technical meetings have been held since 1990 at the national, regional and international level with the objective of analyzing priority environmental problems of the coastal zone of the Gulf of Mexico and the Caribbean, and of defining actions and measures for its integrated management and administration (Table 31.5).

On a regional and bilateral plan the 11 states bordering the Gulf of Mexico (Florida, Alabama, Mississippi, Louisiana, Texas, Tamaulipas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo) created, in 1995, an instrument called the Gulf of Mexico States Accord (GOMSA). Ever since this instrument has promoted annual conferences to bring together officials at the federal and state levels, businessmen, investors, scientists and citizens, to work on agreements and projects for the sustainable development of this region.

At the federal level, SEMARNAT recently formed a Monitoring Group for Seas and Coasts to harmonize criteria, synchronize actions and coordinate the development of a common short- and medium-term strategy. The objectives of this group are: a) to strengthen institutional ability to address the coastal zone's environmental problems; b) to consolidate an intersectorial group for coordination and monitoring of matters related to seas and coasts; c) to lay the groundwork for an integrated environmental management strategy and the mechanisms for its development; and d) to construct the environmental framework for a national policy on seas and coasts (Martínez and Lacy 2003).

In addition to the above it is important to also acknowledge: a) the great ecological, social, economic and geopolitical importance of the coastal zone of the Gulf of Mexico and the Caribbean for Mexico and at a regional level (wider Caribbean); b) the grave problems involving contamination, environmental impacts and risks faced by the region, which seriously compromise its ecological integrity; and c) the urgent need to implement strategies and instruments for integrated planning, management and administration. In 2001 the Coastal Resources Program of the Instituto de Ecología, A.C. (INECOL) implemented an instrument named Panel for the Gulf of Mexico and the Caribbean Integrated Coastal Zone Management (Gulf of Mexico/Caribbean ICZM Panel).

GULF OF MEXICO/CARIBBEAN ICZM PANEL

This panel is a technical-scientific instrument of regional and permanent character to voice opinions, analyze and make recommendations for planning, administration and decision-making about the Gulf of Mexico and Caribbean Sea ICZM (Fig. 31.5). The panel is comprised by the key players that have an influence on the use, management and administration

Table 31.5. Technical-scientific meetings and workshops on the coastal zone of the Gulf of Mexico and the Caribbean.

Year	Event
1990	First USA-Mexico Symposium, The Environmental and Economic Status of the Gulf of Mexico. New Orleans, LA, USA, December.
1992	Diploma course, Ecological Economics in Coastal Ecosystems of the Gulf of Mexico. Campeche, Mexico, February.
1992	Delta Assembly, Preservation of the Global Environment and Development of a Shared Vision for the Gulf of Mexico. New Iberia, LA, USA, March.
1992	Second USA-Mexico Symposium, The Gulf of Mexico, a Shared Sea. Tarpon Springs, FL, USA, December.
1993	USA-Mexico Symposium, Environmental Management of Enclosed Coastal Seas, the Gulf of Mexico, EMECS'93. Baltimore, MD, USA, November.
1995	Third USA-Mexico Symposium, The Gulf of Mexico, Sailing Towards the Future. Corpus Christi, TX, USA, March.
1995	First Conference of the Governors of the Gulf of Mexico States Agreement. Campeche, CM, Mexico, May.
1995	First Meeting on Health, Ecology and the Environment. Conference of the Governors of the Gulf of Mexico. Instituto de Ecología, A.C., Xalapa, VE, Mexico, September.
1995	Fourth USA-Mexico Symposium, The Gulf of Mexico Large Marine Ecosystem: Assessment, Sustainability and Management. Tampa, FL, USA, September.
1996	Second Conference of the Governors of the Gulf of Mexico States Agreement. Mobile, AL, USA, May.
1998	TEMA Workshop, Networks of the Wider Caribbean for Integrated Management of Coastal Areas, IOCARIBE. Cartagena, Colombia, September.
1998	Third Conference of the Governors of the Gulf of Mexico States Agreement. Tampa, FL, USA, February.
2000	Conference, North American and European Perspectives on Oceanic and Coastal Politics (COSU). Cancun, QR, Mexico, November.
2000	Fourth Conference of the Governors of the Gulf of Mexico States Agreement. Villahermosa, TB, Mexico, August.
2000	Workshop, Environmental Strategy for the Integrated Management of the Coastal Zone of Mexico: Challenges for Sustainable Development. Instituto Nacional de Ecología (INE – National Institute of Ecology)–Secretaría del Medio Ambiente y Recursos Naturales (SEMARNAT - Secretariat of Environment and Natural Resources), Mexico, DF, Mexico, November.
2001	First Panel, Needs for the Administration and Integrated Management of the Coastal Zone of the Gulf of Mexico and the Caribbean Sea. Instituto de Ecología, A.C., SEMARNAT. Xalapa, VE, Mexico, November.
2002	Fifth Conference of the Governors of the Gulf of Mexico States Agreement. Boca del Río, VE, Mexico, January.
2002	Workshop, Cartography of North American Coastal Marine and Estuarine Ecological Regions, CCA. Charleston, SC, USA, March.
2002	Workshop, Coastal Sustainability, National Preparatory Committee for Johannesburg '02. Campeche, CM, Mexico, July.
2002	First Global International Waters Assessment (GIWA) Workshop, Subregion-2, Gulf of Mexico GIWA. Veracruz, VE, Mexico, August.

Table 31.5. Continued

Year	Event
2003	Second Panel, Needs for Integrated Administration and Management of the Coastal Zone of the Gulf of Mexico and the Caribbean Sea. Instituto de Ecología, A.C., SEMARNAT. Xalapa, VE, Mexico, March.
2003	Second GIWA Workshop, Detailed Assessment. Analysis of the Causal Chain. Analysis of Political Options. Global International Waters Assessment, Subregion-2, Gulf of Mexico GIWA. Xalapa, VE, Mexico, June.
2003	International Seminar, Environmental Practices in Offshore Oil Exploration and Production Activities, Petróleos Mexicanos (PEMEX – Mexican Petroleum)-SEMARNAT. Veracruz, VE, Mexico, April.
2003	Gulf of Mexico States Agreement. Meeting of Working Groups. Health, Ecology and Environmental Agenda. Mérida, YU, Mexico, October.

of this region's coastal zone at the federal, state and municipal levels. Also participating in the panel are important players from the USA, as well as different international institutions and non-governmental organizations. The objectives of the Gulf of Mexico/Caribbean ICZM Panel are (Yáñez-Arancibia and Zárate 2001; Zárate and Yáñez-Arancibia 2003):

- To identify and evaluate the main environmental, social, economic and normative problems faced by the coastal zone of the Gulf of Mexico and the Caribbean, which hinder and/or foster its sustainable development.
- To help define priority actions and goals for the integrated management and administration of the coastal zone of the Gulf of Mexico and the Caribbean.
- To establish a transdisciplinary, intersectorial workgroup to shape agendas towards the region's ICZM Program.
- To propose and define terms of reference for the Gulf of Mexico/Caribbean ICZM Program.

As a scientific-technical instrument the Gulf of Mexico/Caribbean ICZM Panel interacts with the SEMARNAT, the Gulf of Mexico States Accord and other players involved in the use and management of the region's resources, in order to help harmonize criteria, synchronize actions and develop common short-, medium- and long-term strategies for the ICZM. As a result of two technical meetings the Gulf of Mexico/Caribbean ICZM Panel has identified and reached a consensus on priority environmental problems and strategic issues to be addressed by ICZM strategies, as presented in Table 31.6 (Yáñez-Arancibia and Zárate 2001; Zárate and Yáñez-Arancibia 2003).

PROPOSAL FOR THE GULF OF MEXICO/CARIBBEAN ICZM PROGRAM

In line with all of the above, the Panel is working on a proposal for the Gulf of Mexico and the Caribbean Integrated Coastal-Marine Zone Management Program (Gulf of Mexico/Caribbean ICZM Program). The objectives and functions proposed for this program are (Zárate and Yáñez-Arancibia 2003):

- To preserve and protect the productivity, biodiversity and basic functions of coastal ecosystems.

- To promote and ensure sustainable development of economic activities and sustainable exploitation of natural resources.
- To curb, prevent and reverse contamination and deterioration of the coastal zone due to land- and sea-based activities.
- To restore and rehabilitate damaged critical areas, ecosystems and ecological processes.
- To reduce the vulnerability of human settlements, infrastructure and production activities to natural hazards.
- To promote the integration and elaboration of policies based on social consensus for the sustainable regional development.
- To strengthen and harmonize the sectorial management of the coastal zone.
- To institutionalize the ICZM Program with a long-term perspective.
- To define and execute ICZM plans and strategies at bilateral and regional levels in order to effectively address strategic environmental issues and problems of the Gulf of Mexico and the Caribbean.

The panel proposes that, as a first-generation agenda, the Gulf of Mexico/Caribbean ICZM Program be comprised of ten subprograms, as shown in Figure 31.6. The objectives, projects and actions proposed by the panel for each of these subprograms are summarized in Table 31.7.

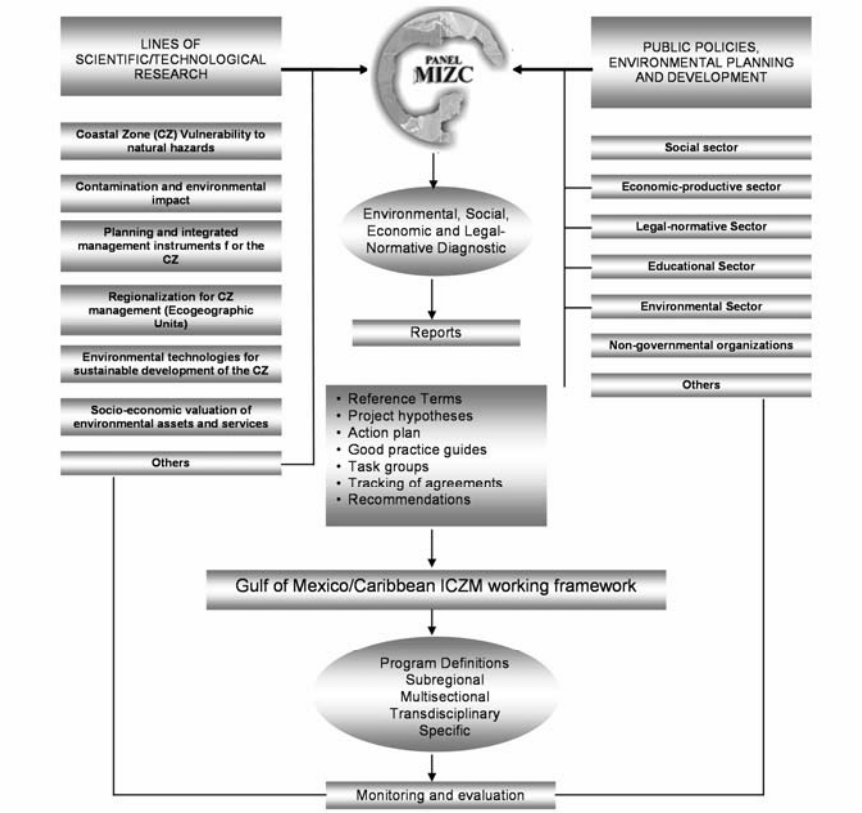

Fig. 31.5. Gulf of Mexico and Caribbean Coastal Zone Integrated Management panel (Gulf of Mexico/Caribbean ICZM panel)

Table 31.6. Strategic environmental problems and issues identified by the Gulf of Mexico/Caribbean ICZM panel (Zárate and Yáñez-Arancibia 2003).

Priority environmental problems
• Fragmentation and loss of ecosystems, plant cover, biodiversity and soils due to an expansion of the agricultural, ranching, urban and industrial frontiers. • Contamination of aquifers, soils, rivers and coastal zone by disposal of urban, agricultural, and industrial wastewater, among others. • Water and soil contamination by urban and industrial solid waste, among others. • Atmospheric contamination. • Public health problems derived from contamination of water, soil and organisms. • Overexploitation and depletion of resources. • Effects on the population, infrastructure and economic activities due to natural phenomena and hazards. • Coastal erosion and accretion due to port/industrial infrastructure and expansion of the agricultural and ranching frontier in middle and upper river basins.
Strategic issues for the ICZM
• Absence of a legal-administrative framework and of an instrument for intergovernmental and intersectorial coordination which allows ICZM of the Gulf of Mexico/Caribbean. • Lack of an updated regional environmental diagnostic, agreed upon at the federal and state levels. • Lack of an environmental information system for ICZM. • Limited resolution of intersectorial conflicts. • Limited application of environmental and sustainability criteria in sectorial planning. • Unplanned coastal urbanization with limited infrastructure and basic services. • Limited access to environmental technologies. • Limited coordination between the definition and application of environmental policy instruments with a vision towards ecosystems and basins. • Absence of environmental dissemination, training and education programs aimed towards ICZM. • Limited participation based on joint responsibility of society in environmental planning and decision-making, as well as in the utilization and conservation of resources. • Promotion of the strengthening of state and municipal management. • Compliance and promotion of international, regional and bilateral agreements.

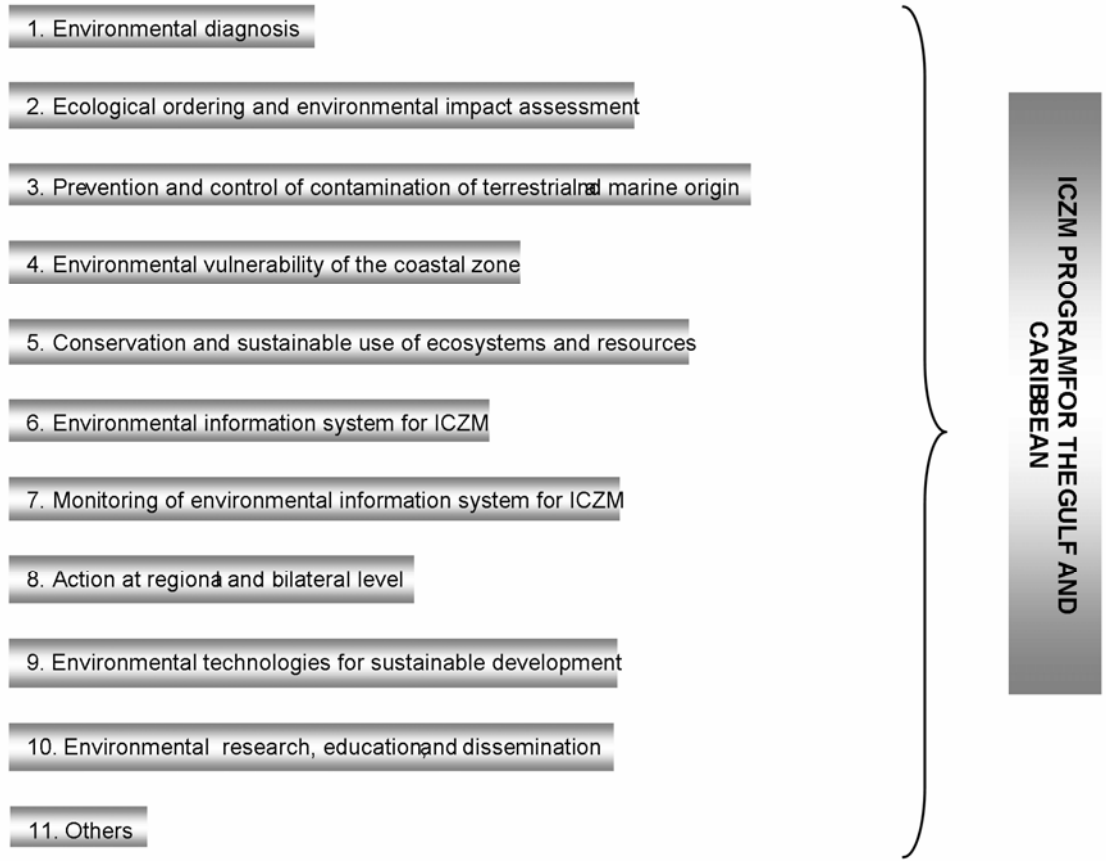

Figure 31.6. Main components of the Gulf of Mexico/Caribbean ICZM program proposed by the Gulf of Mexico/Caribbean ICZM panel (Zárate and Yáñez-Arancibia 2003; Zárate *et al.* 2003).

Table 31.7. Main components of the proposal of the Gulf of Mexico and the Caribbean Coastal Zone Integrated Management Program (Zárate and Yáñez-Arancibia 2003; Zárate *et al.* 2003).

Subprogram	Components and Objectives
1. Environmental diagnosis for the Gulf of Mexico/Caribbean Coastal Zone (CZ)	Current status of ecosystems, resources and land at the regional and state levels.
	Identification and evaluation of major contaminant sources and environmental impact.
	Evaluation of natural hazards.
	Resources, ecosystems and regions with critical environmental problems.
	Criteria for coastal zone delimitation for ICZM.
	Limitations and needs of environmental policy instruments to be applied in the coastal zone.
	Sectorial programs and projects affecting the coastal zone.
	Environmental technologies applicable to the coastal zone.
	Criteria for managing type ecosystems in the coastal zone.
2. Ecological ordering and environmental impact assessment of the Coastal Zone	Acceptance of Ecological Ordering (EO) as a basic instrument for planning at the regional, sectorial, state and municipal levels.
	Acceptance of Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) as instruments for determining feasibility of development activities, projects, plans, programs and policies.
	Definition and execution of Regional Ecological Ordering programs with an integrated vision of ecosystems and river basin management.
	Definition of integrated strategies for coordinating environmental policy instruments (EIA, protected natural areas, Zona Federal Marítimo Terrestre y Ambientes Costeros [ZOFEMATAC; Federal Maritime Terrestrial Zone and Coastal Environments] and urban ordinances).
	Definition of integrated management guidelines and criteria by ecosystem and production sector.
3. Prevention and control of contamination from terrestrial and marine origin	Identification of terrestrial sources. Regional GIS (Geographic Information System) inventory of terrestrial and marine pollution sources.
	Determination of contamination levels and background studies on contamination of water, soils, organisms and ecosystems.
	Definition and enforcement of technical, legal, and administrative measures for pollution prevention and control. Program for the Integrated Management of Liquid and Solid Waste.
	Evaluation and remediation of damaged resources and ecosystems.
	Definition of intercalibrated parameters for monitoring and trends analyses.
	Definition of projects for investment for pollution prevention and control.

Table 31.7. Continued.

Subprogram	Components and Objectives
4. Environmental vulnerability of the Gulf of Mexico/Caribbean CZ	Evaluation of effects in the coastal zone due to climate change, sea level rise, hydrometeorological phenomena, subsidence, coastal deposition and erosion, red tide, others. Atlas of natural hazards and threatened areas. Environmental Information System for Hazard Assessment. Coordination of the program for update of urban coastal regulations and ZOFEMATAC.
5. Conservation and sustainable use of ecosystems and resources	Protection and management of critical coastal ecosystems and resources. Promotion of sustainable management of resources, especially regarding efficient water and energy use. Sustainable development of aquaculture and fisheries from an environmental perspective (protection of critical habitats). Participation of social groups with joint responsibility for resources conservation and sustainable use. Evaluation, restoration, remediation and rehabilitation of deteriorated ecosystems and resources.
6. Environmental Information System (EIS) for Integrated Coastal Zone Management (ICZM)	Updated cartography and inventories of ecosystems, resources, problems/opportunities. EIS-ICZM to strengthen environmental planning, management and decision-making with the best available information, as well as dissemination, exchanges and consultations.
7. Monitoring of environmental quality of the Coastal Zone	Definition of environmental quality indices and indicators for the coastal zone. Definition of the monitoring system through coordination of sectorial and academic databases. Periodic preparation of electronic reports.
8. Regional and bilateral action	Mechanisms for strengthening and implementing international agreements. Definition and implementation of bilateral agreements for managing strategic resources and addressing priority problems. Identification and application of environmental technologies for pollution prevention and management.
9. Environmental Technologies for Sustainable Development Program	Identification and application of environmental technologies for sustainable use of coastal resources. Identification and application of environmental technologies for the development of coastal infrastructure and technologies for production of renewable energy.
10. Program for environmental research, education and dissemination	Promotion of education, training and communication processes, and strengthening of citizens participation regarding the protection of the coastal zone and sustainable use of resources. Promote transdisciplinary research projects for the protection, use and management of coastal ecosystems and resources. Prepare books, manuals and guides on ICZM, as well as guidebooks and materials for environmental dissemination and training.

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Appendix 31.1. Legal frameworks for managing the Mexican coastal zone (Zárate *et al.* 1999, 2001).

Federal Legal Framework

- Political Constitution of the United Mexican States (Articles 25 to 27, 73 and 115)
- Ley de Planeación (Planning Law)
- Ley General del Equilibrio Ecológico y la Protección al Ambiente (LGEEPA - General Law of Ecological Equilibrium and the Protection of the Environment)
    - Regulations on Environmental Impact
    - Regulations on Ecological Ordering
    - Regulations on Atmospheric Pollution Prevention and Control
    - Regulations on Hazardous Waste
    - Regulations for Environmental Protection Against Noise Pollution
- Ley General de Bienes Nacionales (General Law of National Property)
- Ley de Águas Nacionales (Law of National Waters)
    - Regulations of the Law of National Waters
- Ley de Pesca (Fisheries Law)
    - Regulations of the Fisheries Law
- Ley Forestal (Forestry Law)
    - Regulations of the Forestry Law
- Ley de Vías Generales de Comunicación (Law of General Communication Routes)
    - Regulations of Article 124 of the Law of General Communication Routes
- Ley Federal del Mar (Federal Law of the Sea)
    - Regulations for the Use and Exploitation of the Territorial Sea, Navigable Routes, Beaches, Federal Maritime-Terrestrial Zone and Lands Reclaimed from the Sea
    - Regulations for Prevention and Control of Marine Contamination by Disposal of Waste and Other Materials
- Ley Minera (Mining Law)
- Ley de Vida Silvestre (Wildlife Law)
- Ley Federal de Caza (Federal Hunting Law)
- Ley Agraria (Law of Agriculture)
- Ley Federal de Turismo (Federal Law of Tourism)
    - Regulations for Tourist Diving Services
    - Regulations of the Federal Law of Tourism
- Ley Federal sobre Monumentos y Zonas Arqueológicas, Artísticas e Históricas (Federal Law for Archeological, Artistic and Historic Monuments and Zones)
- Ley General de Asentamientos Humanos (General Law of Human Settlements)
- Ley de Conservación del Suelo y Agua (Law of Conservation of Soil and Water)
- Ley General de Salud (General Law of Health)
- Ley de Navegación (Navigation Law)
    - Regulations of the Navigation Law
- Ley de Puertos (Ports Law)
    - Regulations of the Ports Law
- Ley General de Inversión Extrangera (General Law of Foreign Investment)

- Ley Federal sobre Metrologia y Normalización (Federal Law on Measurements and Normatization)
- Ley Orgánica de la Administración Pública Federal (Organic Law of the Federal Public Administration)
- Ley Federal de Derechos (Federal Law of Rights)
- Código Penal Federal (Federal Penal Code)
- Reglamento para Uso y Aprovechamiento del Mar Territorial, Vías Navegables, Playas, Zona Federal Marítimo Terrestre y Terrenos Ganados al Mar (Regulation for the Use and Exploitation of the Territorial Sea, Navigable Waters, Beaches, Federal Maritime Zones and Lands Reclaimed from the Sea)
- Otros Materiais (Regulation to Control Marine Contamination by Disposal of Wastes and Other Materials)
- Reglamento de Parques Nacionales e Internacionales (Regulation of National and International Parks)
- Reglamento del Registro Público de la Propiedad (Regulation of Public Registry of Property)
- Reglamento Interior de la Comisión Intersecretarial de Saneamiento Ambiental (Internal Regulation of the Intersecretariat Comission of Environmental Sanitation)
- Reglamento para la Determinación de Coeficientes de Agostadero (Regulations for Determination of Grazing Coefficients)
- Decreto de Áreas Naturales Protegidas Federales (Decree of Federal Protected Natural Areas)
    - Biosphere Reserves (6)
    - National Parks (7)
    - Flora and Fauna Protection Areas (3)
    - Under Reclassification (1)
- Normas Oficiales Mexicanas (Official Mexican Standards)
    - NOM-001-ECOL-1996. Sets the maximum allowable limits for contaminants in wastewaters discharged in national waters and properties.
    - NOM-059-ECOL-1994. Determines the terrestrial and aquatic wildlife species and subspecies of flora and fauna that are endangered, threatened, rare and those under special protection, and sets specifications for their protection.
    - NOM-002-PESC-1993. Regulates the exploitation of all shrimp species in waters under Mexican federal jurisdiction.
    - NOM-006-PESC-1993. Regulates the utilization of all lobster species in waters under Mexican federal jurisdiction in the Gulf of Mexico and the Caribbean Sea, as well as in the Pacific Ocean, including the Gulf of California.
    - NOM-008-PESC-1993. Regulates the exploitation of octopus species in waters under Mexican federal jurisdiction in the Gulf of Mexico and the Caribbean Sea.
    - NOM-009-PESC-1993. Establishes the procedure to determine closure seasons and areas for catching different species of aquatic flora and fauna in waters under Mexican federal jurisdiction.
    - NOM-011-PESC-1993. Regulates the application of quarantines to prevent the introduction and dispersion of certifiable and notifiable diseases through the importation of live aquatic organisms in any developmental stages for aquaculture and ornamental uses in Mexico.

- NOM-013-PESC-1994. Regulates the exploitation of gastropods in waters under Mexican federal jurisdiction in the states of Campeche, Quintana Roo and Yucatan.
- NOM-015-PESC-1994. Regulates the extraction of natural oyster stocks in lagoon-estuarine systems of the State of Tabasco.
- NOM-016-PESC-1994. Regulates fisheries of striped and white mullet in waters under Mexican federal jurisdiction in the Gulf of Mexico and the Caribbean Sea, as well as in the Pacific Ocean, including the Gulf of California.
- NOM-017-PESC-1994. Regulates sports/recreational fisheries in waters under Mexican federal jurisdiction.
- NOM-23-PESC-1996. Regulates longline tuna fisheries in waters under Mexican federal jurisdiction in the Gulf of Mexico and the Caribbean Sea.
- NOM-EM-001-PESC-1999. Sets requirements and measures for preventing and controlling the introduction and dispersion of the viral diseases called white spot baculovirus (WSBV) and yellow-head virus (YHV).
- NOM-022-SEMARNAT-2003. Sets specifications for the preservation, conservation, sustainable use and restoration of coastal wetlands in mangrove areas.

State Legal Framework

- Political Constitutions of the states of Tamaulipas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo
- Law of Ecological Balance and Environmental Protection of the State of Tamaulipas
- State Law of Ecological Balance and Environmental Protection of the State of Veracruz
- Law of Ecological Balance and Environmental Protection of the State of Tabasco
- Law of Ecological Balance and Environmental Protection of the State of Campeche
- Law of Ecological Balance and Environmental Protection of the State of Yucatán
- Law of Ecological Balance and Environmental Protection of the State of Quintana Roo
- Regulation of Environmental Impact
- Municipal regulations

Appendix 31.2. International or regional treaties and other legal instruments pertinent to the management of Mexico's coastal zone (Zárate *et al.* 1999, 2001)

World Treaties and Instruments

- United Nations Convention on the Law of the Sea
- Convention on the High Seas
- Convention on the Territorial Sea and the Contiguous Zone
- Convention on the Continental Shelf
- International Convention on Salvage
- International Convention on Maritime Search and Rescue
- Convention on Limitation of Liability for Maritime Claims
- International Conventions on Prevention of Pollution of the Sea by Hydrocarbons Spills and by Dumping of Waste and Other Hazardous Materials
- United Nations Convention on Environment and Development. Earth Summit
- Agenda 21. Chapter 17. Protection of the Oceans, All Kinds of Seas, Including Enclosed and Semi-Enclosed Seas, and Coastal Areas and the Protection, Rational Use and Development of Their Living Resources
- Code of Conduct for Responsible Fisheries
- International Convention for the Regulation of Whaling
- Convention on Fishing and Conservation of the Living Resources of the High Seas
- International Dolphin Conservation Program
- Convention on Wetlands of International Importance, Especially as Waterfowl Habitat (Ramsar Convention)
- International Convention for the Prevention of Pollution from Ships (MARPOL 73/78)
- International Convention on Oil Pollution Preparedness, Response and Cooperation
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter
- International Convention on Civil Liability for Oil Pollution Damage to the Sea
- International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties
- Protocol Relating to Intervention on the High Seas in Cases of Marine Pollution by Substances Other Than Oil
- World Summit on Sustainable Development - Johannesburg 2002

Regional Treaties and Instruments

- North American Agreement on Environmental Cooperation (NAAEC) and the North American Commission for Environmental Cooperation. Governments of Mexico, Canada and the United States of America
- Agreement Instituting the Latin American Organization for Fisheries Development (OLDEPESCA)
- Centre for Marketing Information and Advisory Services for Fishery Products in Latin America and the Caribbean (INFOPESCA)
- Convention Establishing the Association of Caribbean States (ACS)

- Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region and Protocol Concerning Cooperation in Combating Oil Spills in the Wider Caribbean Region
- Mesoamerican-Caribbean Reef System Initiative

Bilateral Treaties and Instruments

- Agreement for the Provisional Recognition of the Maritime Borders between Mexico and the United States
- Cooperation Agreement between Mexico and the United States on Marine Pollution by Spills of Oil and Other Hazardous Substances