

GULF OF MEXICO

Strategic Action Program (SAP)

The Gulf of Mexico Large Marine Ecosystem is threatened by diverse anthropogenic activities that put in risk its integrity and resilience.

These activities had been developed for many years, such as excessive fishing effort, destruction of critical coastal and marine habitats, nutrient –enrichment coming from the upper watersheds due to agricultural activities, extensive oil and gas production and increasing tourism industry.

In this region many natural resources are shared, migratory or connected. This evidence the tight interdependencies in terms of causes and effects, and an LME wide, ecosystem base management approach is required to effectively mitigate them in the long-term.

Nowadays, the existing management approaches are not consistent with an ecosystem-based perspective and there are no agreed bi-national programs for managing the region resources taking into account ecosystem based requirements.

Mexico and U.S. have institutional frameworks for coastal and marine resources protection, but there is no mechanism for an effective regional inter-sectoral coordination between them.

The TDA and SAP processes will provide the framework in order to remove identified constraints and barriers, develop common mechanisms and tools, and promote reforms and investments, to set the bases for application of the ecosystem approach in the management of the GoM LME. This will help to address the priority transboundary problems identified in the region.

The transition towards the ecosystem-based management of the GoM LME will depend on a greater convergence of policy tools including long-term joint programs and actions, a clearer distribution of competences at all three levels of government and a robust monitoring and evaluation program.

The process of development and accordance of SAP and NAP provides the harmonization of the policy approach between the countries, as well as the modification of the legal and institutional framework. This will be implemented at a national level, and will pursue the conscious and committed interaction of the private sector, including the oil and gas industries, fisheries, tourism and other strategic economic activities. It will allow the local authorities to reach consensus about the objectives, priority issues, governance, programs and projects to protect, manage, recover and maintain the ecosystems and the common resources of the GoM LME region.

The GoM LME project has identified five main transboundary problems to be addressed:

- Eutrophication, dead zones, Harmful Algal Blooms (HABs) and red tides.
- Habitat modification (loss of mangroves, connectivity and resilience).
- Over exploitation of living marine resources (Decrease of fisheries).
- Perception of isolated species rather than ecosystem based management.
- Inadequate assessment of the value of environmental services and goods.

This five problems lead to establish three main objectives:

- Reduction of Pollutants and Nutrient loads.
- Recovery of over-exploited marine resources.
- Rehabilitation of Marine and Coastal Ecosystems

Reduction of Pollutants and Nutrient loads

Eutrophication and harmful algal blooms

Along the US coast of the GoM LME, coastal eutrophication is growing. This has resulted in an increase in the frequency and extent of harmful algal blooms and oxygen depletion events affecting fish and invertebrates.

In the Mexican portion of the Gulf, practically all the coastal populations discharge their domestic waste into the rivers, estuaries, coastal lagoons and the sea without any treatment. Consequently the coastal lagoons of the Gulf of Mexico are highly stressed. In addition, the Gulf of Mexico also suffers from eutrophication, particularly in bays, estuaries and coastal lagoons, as a result of direct discharges from the increasing coastal population and nutrient inputs from agricultural runoff. This has resulted in the presence of a large seasonal "dead zone" at the mouth of the Mississippi river, and the increasing frequency of red and brown tides along the coast of the Gulf of Mexico. The Dead Zone is largely caused by excess nitrogen and phosphorus entering the Gulf from the Mississippi River. These nutrients result in huge algae and phytoplankton blooms. As the blooms die, they drop to the ocean floor and decompose. The stratification of the ocean water that occurs during the summer in the Gulf prevents the deepest water from becoming re-oxygenated. As a direct result, oxygen levels fall below 2 mg/l, a level at which most marine life, including all commercial fish, crab and shrimp species, cannot survive. In the last 5 years hypoxic events have affected an area of 14,128 km² off the coast of the state of Louisiana alone.

The Dead Zone is now one of the largest hypoxic zones of water in the world. The average concentration of nitrate-nitrogen in the main stem of the Mississippi River has doubled since 1950. Commercial fertilizer is the single largest contributor. Others include animal wastes from intensive livestock rearing plants (pigs and cattle), municipal and domestic waste, and atmospheric deposition. In addition to the Mississippi Dead Zone, there is potential for development of another dead zone off the large Grijalva-Usumacinta River system in the southern Gulf of Mexico as population and land use pressures increase in the drainage area.

Oil pollution

The oil industry is the single most important economic sector in Mexico. Oil extraction is particularly important in the states of Tabasco and Campeche, the reserves of which are considered to be amongst the most important in the Western Hemisphere. Approximately 85 % of the oil extraction (an average of 1.5 million barrels of crude oil per day) and 90 % of the natural gas production of Mexico originates in the Gulf and its coastal plain.

The Gulf also produces 72 % of the U.S. offshore petroleum production. Current production is approximately eight million barrels per day, well below the peak production of 11.5 million barrels per day in the early 1970's. Waste from both ships and oil rigs, which punctuate the continental shelf of both the United States and Mexico, contributed to the Gulf being labelled the "dumping ground for a hemisphere's trash." Oil extraction and transport are of great concern for ecosystem health in the Gulf of Mexico. Environmental effects of oil extraction have been documented for the southern Gulf of Mexico but transboundary effects are less well studied.

Trace metals and organic pollution

Contamination from trace metals (including mercury levels in fish), persistent organic compounds (pesticides, PCB's and PAHs) from urban areas, industry and agriculture, and mercury levels in fish and human health concerns are also potentially significant and have human health consequences. For example, the presence of metals and persistent organic compounds and hydrocarbons has been detected in the silts of the main coastal lagoon systems.

Groundwater quality issues

There is an increasing risk of overexploitation of already scarce water resources, given that coastal ecosystems of the Yucatan Peninsula are hydrologically controlled by the discharges of subterranean water and coastal-oceanic interactions. There is evidence that anthropogenic activities including urbanization, agriculture, industry and aquaculture are all resulting in water quality deterioration. Consequently, the upper layer of the aquifer is severely contaminated. The risk to the coastal zone in the Yucatan Peninsula from human activities is increased because the underlying rocks are fractured by weathering, which results in rapid water flow through the aquifer. The consequence of this is that there is little time for microbial or other processes to deplete contamination. Rivers are a central link in the chain of nutrient and pollutant transfer from river basins to coastal systems. Therefore, an Integrated Coastal and River Basin Management framework (which approaches the continuum as an ecosystem) must be employed as the joint strategy to tackle the urgent mentioned issues.

Final Outcome and Objectives

The final expected outcome of this project component is to contribute in the development of strategies and actions for the reduction and control of nutrient over-enrichment, HAB's and for the elimination of dead zones developed.

For this to be achieved, four objectives are followed:

- Regional Plan of Action for the Yucatan Peninsula (RPA-YUCATAN) developed by Mexico as a major contribution to reduce land based sources of pollution into the GoM-LME, implemented.
- Strategic Partnerships between GoM-LME programme and institutions responsible for integrated management of the major GoM river basins, as well as the main coastal cities, developed.
- Stocktaking of the Papaloapan watershed Commission to define opportunities for replication in the Grijalva-Usumacinta and Panuco river basins in order to provide for strong inter-linkages between watershed management authorities and coastal managers.
- Strategies for harmonizing legislative, policy and regulatory frameworks on agricultural practices at LME wide levels developed, building upon the Gulf of Mexico Governors Alliance.

Recovery of over-exploited marine resources

Sustainable Management and use of Living Marine Resources Component

The Gulf of Mexico Large Marine Ecosystem supplies a diverse range of goods and services to the global community but these stand threatened by human-induced pressures, including overfishing. These threats are transboundary in nature, and cannot be effectively abated through stand-alone national initiatives. Global benefits can be secured through the institution of a LME ecosystem-based management framework, allowing the countries to strengthen the management of LME living resources. In this sense, the Strategic Action Program of the GOM LME Living Marine Resources expects to set interventions through the following:

Final Outcome and Objectives

The final expected outcome of this project component is to formulate strategies and actions for sustainable management and use of exploited living marine resources, and for the recovery of depleted fish stocks to within safe biological limits.

For this to be achieved, three objectives are followed:

- Bi-lateral initiatives for regional surveying of productivity and oceanography, stock assessment and population assessments encouraged and strengthened.
- Review effectiveness of compliance measures with existing fisheries legal and regulatory frameworks in both countries, especially with regards to Illegal, Unregulated and Unreported (IUU) fishing, excessive fishing capacity, and enforcement and surveillance, and propose appropriate reforms and measures.
- Develop fisheries management plans for selected key commercial fisheries.

Rehabilitation of Marine and Coastal Ecosystems

Conservation, Ecosystem and Biodiversity Component

The Gulf of Mexico is an important global reservoir of biodiversity. Coastal wetlands, which are critical ecosystems for the exceptional productivity of fish and shellfish provide essential habitat for shorebirds, colonial nesting birds, and migratory waterfowl. They are home to an incredible array of indigenous flora and fauna, including endangered species such as sea turtles, manatee, crocodiles, and orchids. Moreover, the estuaries and coastal wetlands are recognized as vital in providing food and shelter for wildlife, improving water quality, sediment filtration, and flood and erosion control.

The goal is to promote the ecosystem-based approach for developing recovery plans for depleted priority non-commercial species and associated marine flora and fauna for additional species not currently addressed, defining management and capacity building requirements to restore degraded marine coastal wetlands, enhancing sectoral links among users in marine and coastal zones, strengthening and implementing marine and coastal spatial zoning processes in individual countries, and supporting and harmonizing LME-wide strategies in order to maintain habitat functional and structural integrity in the coastal zones of the GoM LME to conserve associated biodiversity, and to ensure economic and social benefits of future generations.

Final Outcome and Objectives

The final expected outcome of this project component is to establish representative marine protected areas.

For this to be achieved, four objectives are followed:

1. Recovery plans for depleted priority non-commercial species and associated marine flora and fauna developed for additional species not currently addressed.
2. Management and capacity building requirements to restore degraded marine coastal wetlands defined.
3. Marine and coastal spatial zoning processes in individual countries strengthened and implemented thus enhancing sectoral links among sectoral users in marine and coastal zones.
4. LME-wide strategies for conserving biodiversity and habitats in the coastal zones of GoM LME supported and harmonized at a regional level