Integrated Assessment and Management of the Gulf of Mexico Large Marine Ecosystem

Strategic Action Programme (SAP)

GLOBAL ENVIRONMENT FACILITY

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

GULF OF mexico LME

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Abbreviations and Acronyms

CIMARES   Inter-secretarial Commission for the Integrated Management of Oceans and Coasts

CiiMar-GoM Mexican Consortium of Marine Research Institutions of the Gulf of Mexico

EIA   Environmental Impact Assessment

EPA   Environmental Protection Agency

EEZs   Exclusive Economic Zones

GCOOS   Gulf of Mexico Ocean Observing System

GEF   Global Environment Facility

GOMA   Gulf of Mexico Alliance

GoM LME   Gulf of Mexico Large Marine Ecosystem

GOMURC   Gulf of Mexico University Research Collaborative

GPA   Global Programme of Action for the Protection of the Marine Environment from Land-based Activities

HABIOS   Harmful Algal Bloom Integrated Observing System.

IGOMMPAN International Gulf of Mexico Marine Protected Areas Network

IW   International Waters

MARPOL   International Convention for the Prevention of Pollution from Ships

NAP   National Action Plan

NOAA   National Oceanic and Atmospheric Administration

NOC   National Ocean Council

PCU   Programme Coordination Unit

SAP   Strategic Action Programme

SEMARNAT Ministry of Environment and Natural Resources

TDA   Transboundary Diagnostic Analysis

UNIDO   United Nations Industrial Development Organization

U.S.   United States of America

U.S.GS   United States of America Geological Survey

EXECUTIVE SUMMARY

This Strategic Action Programme (SAP) is a policy document negotiated by the governments of United Mexican States (Mexico) and the United States of America (U.S.) through the coordination of the appointed Technical National Focal Points to the Gulf of Mexico Large Marine Ecosystem Project (GoM LME), the Secretaría de Medio Ambiente y Recursos Naturales (**SEMARNAT**) of Mexico and the National Oceanic and Atmospheric Administration (**NOAA**) of the U.S. The document outlines the Strategic Action Programme (SAP) for the GoM LME and aims to promote shared policy goals and legal and institutional actions to address priority transboundary problems that have been previously identified by both **NOAA** and **SEMARNAT** in the Transboundary Diagnostic Analysis (TDA). The TDA was completed in October 2011 and is the primary source of scientific and technical information for the recommended strategic actions presented.

This document and the TDA have been developed as part of the project, "Integrated Assessment and Management of the Gulf of Mexico Large Marine Ecosystem", with the financial support of the Global Environment Facility (GEF) and the implementation support of the United Nations Industrial Development Organization (UNIDO).

In the SAP, 6 strategic areas are identified to outline 71 priority actions within 21 action lines:

1. Improve Water Quality
2. Enhance economic vitality by avoiding depletion and recover degraded living marine resources
3. Conserve Coastal and Marine Ecosystems
4. Mitigate and Adapt to Climate Change and Sea Level Rise
5. Improve Science Education and Outreach
6. Cross-Cutting Issues

In addition to presenting the SAP priority actions, this document also illustrates the reasons for establishing cooperation to address the identified transboundary problems in the GoM LME. Specific plans to implement and monitor the proposed strategic actions are also outlined.

The SAP represents a significant step toward the improvement of the environmental and socioeconomic welfare of the GoM LME. It includes specific objectives and associated strategies and actions that the governments of the United States and Mexico intend to take in support of those objectives. The SAP will support the future development of National Action Programmes (NAPs) by the United States and Mexico, through coordination by NOAA and SEMARNAT respectively, to further strengthen regional cooperation and relevant institutions. The SAP reflects and is in the form of a long-term political commitment by the United States and Mexico. All activities envisioned by the SAP are to be conducted in

a manner consistent with applicable U.S. and Mexican domestic laws and regulations, and are subject to the availability of funds, personnel and other resources.

SAP endorsement letters can be found in Annex 1.

1. INTRODUCTION

1.1 The Gulf of Mexico Large Marine Ecosystem

Marine ecosystems and their contributing freshwater basins are transboundary in nature by virtue of interconnected currents, pollution, and movement and migration of marine living resources. There are 66 Large Marine Ecosystems (LMEs) delineated along the continental shelves and coastal currents. They represent multi-country, ecosystem-based management units for measuring the changing states of LMEs, and for taking remedial actions toward the recovery and sustainability of degraded goods and services (Duda and Sherman, 2002; Sherman *et al.* 2009).

The Gulf of Mexico Large Marine Ecosystem (GoM LME) is a semi-enclosed oceanic basin measuring $615,000 mi^2$ (1.6 million km^2) that is shared by Mexico, the U.S. and Cuba. The GoM LME is the ninth largest body of water in the world and the largest semi-enclosed coastal sea in the Western Atlantic. It has a narrow connection to the Atlantic Ocean and numerous bays and small inlets fringe its shoreline. Many rivers drain into the GoM, most notably the Mississippi and Rio Grande rivers in the northern GoM, and the Grijalva and Usumacinta rivers in the southern Gulf. The land that forms the GoM´s coast, including many barrier islands, is almost uniformly low-lying. It is characterized by marshes, swamps and straits of sandy beach. Approximately 55 million people live in the coastal states of the GoM, including 40 million in the United States of America and 15 million in Mexico[1]. The GoM LME supports major fishing industries from three countries, a large oil extraction industry as well as other lucrative economic activities that are important for both the U.S. and Mexico. Recent information suggests that revenues from oil and gas total approximately USD $77.7 billion, tourism totals USD $41.6 billion (77 million tourist per year), fisheries totals USD $1.7 billion (830,000 ton, per year) and port and shipping total USD $0.38 billion[2] (997 million ton. per year).

The GoM LME is one of the most productive marine ecosystems in the world, and an important global reservoir of biodiversity. However, various factors including excessive fishing, destruction of critical coastal and marine habitats, and nutrient over-enrichment greatly threaten the overall health of the Gulf of Mexico.

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[1] **Integrated Assessment and Management of the Gulf of Mexico Large Marine Ecosystem. Project Brief.**

[2] **Transboundary Diagnostic Analysis (TDA)**

Recognizing these threats, the GoM LME Project is an important initiative to promote sustainable management of the Gulf of Mexico ecosystem. Both Mexico and the U.S. recognize the urgent need to address these transboundary issues, as demonstrated by progress made by both countries on the development of various programmes.

However, it is fundamental to promote bilateral cooperation in order to strengthen the impact of unilateral efforts. The relationship between Mexico and the U.S. concerning action related to environmental and conservation issues has been fortified in recent years. Both countries observe national policies that focus on investigation, conservation and sustainable development of the transboundary Gulf of Mexico Large Marine Ecosystem, creating significant common ground.

Likewise, both countries recognize the importance of considering new and innovative schemes for regional cooperation. Such cooperation is being promoted by the GoM LME Project and will support efforts to address the complex transboundary existent issues within the GoM LME.

Efforts to facilitate the active participation of Cuba were made by the project Steering Committee during the project's preparatory phase, although Cuba is not included in the GoM LME according to the global map of the boundaries of the 66 Large Marine Ecosystems of the world. However, the Cuban Vice-Minister of the Ministry for Foreign Investment and Economic Collaboration, Mr. Orlando Requeijo Gual, on behalf of the Government of Cuba officially informed the project partners of its decision not to participate in the project as it did not fit within the framework of the environmental priorities established in the country's Estrategia Ambiental Nacional (National Environmental Strategy). The GEF Agencies and the participating countries recognized that Cuba exercised its sovereign right to determine whether to participate in this initiative.

Both the U.S. and Mexico have established an "open door" policy stating that Cuba's participation in the project would be beneficial and that its reincorporation at any point in the process would be welcome if Cuba decides to join the process.

1.2 Legal and Institutional Framework Applicable to the Gulf of Mexico

Both Mexico and the United States of America, as bordering Nation States to the Gulf of Mexico, face similar challenges in managing ocean resources, and often take similar approaches in addressing these challenges.

Both countries have a legal framework that deals with wetlands, estuaries, harvested species, marine living resources, coral reefs, beaches, conservation of marine ecosystems and coastal areas among other natural resources. However, differences in the two countries' legal and policy frameworks can present a challenge for a collaborative approach.

The Mexican legislation regarding protection and conservation of coastal wetlands considers strict sanctions in its derived ecology and environmental protection, wildlife, sustainable

forest development and laws and regulations. Management instruments, such as the environmental impact assessment, verify that productive projects are viable within the wetland environment.

In both countries there are examples of efforts towards an ecosystem based approach. In the case of Mexico the Inter-secretarial Commission for the Integrated Management of Oceans and Coasts (CIMARES) was created in 2008 through a presidential decree. This Commission is constituted by the Ministries of the Interior, Foreign Affairs, Navy, Social Development, Energy, Economy, Agriculture, Rural Development, Food and Fishing, Transport and Communications, Tourism, and Natural Resources. Also, the programme of Regional and Marine Ecological Planning and Zoning of the Gulf of Mexico and the Caribbean Sea was enacted in November 2012. This environmental marine and land use planning instrument should enable better coordination among economic sectors as well as federal, state and municipal authorities.

In the spring of 2013, the U.S. Obama Administration's National Ocean Council released the "National Ocean Policy Implementation Plan." The plan translates President Obama's "National Policy for the Stewardship of the Ocean, Our Coasts, and the Great Lakes" into actions to benefit the ocean environment, including the Gulf of Mexico.

The efforts carried out by both countries are important steps towards achieving further coordination and institutional mechanisms in the region. However, more actions along these lines would advance an ecosystem-based management of the Gulf of Mexico LME.

1.3 The GoM LME Project Process

The main objective of the GoM-LME project is:

To set the foundations for LME-wide ecosystem-based management approaches to rehabilitate marine and coastal ecosystems, recover depleted fish stocks, and reduce nutrient overloading.

To accomplish these goals, the project has implemented a series of actions, including the finalization of the Transboundary Diagnostic Analysis (TDA), the development of a Strategic Action Programme (SAP), the delivery of three demonstration projects: Monitoring and Environmental Evaluation, Sustainable Fisheries, and Habitat Rehabilitation. It has also implemented cross cutting actions on environmental education and awareness, and climate change.

As a binational effort between agencies of the United Mexican States (Mexico) and the United States of America (U.S.), the GoM LME SAP aims to identify policy, legal and institutional actions to address priority transboundary challenges facing the GoM LME. Efforts that started in 2009 with collaboration between **NOAA** and **SEMARNAT**, resulted in the SAP, and will be followed by the development of National Action Plans (NAPs) to address specific national priorities.

The Global Environment Facility (GEF) requires the development of SAPs as part of its International Waters Operational Strategy. GEF LME projects show that an ecosystem-based approach helps focus on addressing priority transboundary issues in an integrated manner. Objective 1 of the GEF-5 IW Focal Areas Strategy clearly states that the GEF will support the further development and implementation of policies and measures specified in the SAP. This presents a unique opportunity to continue and enhance the work already carried out in the Gulf of Mexico LME project in order to assure that the hard work invested in developing the SAP achieves its intended impact.

The United Nations Industrial Development Organization (UNIDO) is the sole implementing agency for the GoM LME project. UNIDO has experience with several projects under the International Waters focal area, including LME specific projects. This experience is a valuable asset to the Gulf of Mexico region, as it can take the best experiences and lessons learned from other projects and learn from areas that can be improved. In addition to the technical expertise of UNIDO, the Project Coordination Unit (PCU) also assists with facilitating communication and cooperation efforts between **NOAA**, **SEMARNAT** and the other agencies involved in this project.

The three demonstration projects: Monitoring and Environmental Evaluation, Sustainable Fisheries, and Habitat Rehabilitation, are all being conducted in the same site, Laguna de Terminos, in the Mexican state of Campeche. This is a coastal lagoon in the estuary of the Grijalva-Usumacinta river system, which accounts for roughly 30% of Mexico's freshwater runoff. The watershed includes three countries, Mexico, Belize and Guatemala, and it has very high biodiversity, rates of endemism, and diversity of habitats. It is a nursery ground for many species, including many with commercial value.

The sustainable fisheries pilot project aims to provide a framework for the sustainable use of fisheries resources, using ecosystem-based management. Its primary focus is the shrimp multispecies fishery, one of the most important in the southern Gulf of Mexico. The main drivers that account for the decline of this fishery are one of the study areas of this project, where overfishing and climate change among others are being considered. The ecosystem restoration pilot project aims to improve ecosystem health and resilience by restoring mangrove communities through ecological restoration actions and involve local communities and institutional coordination. Strong community participation and close collaboration with the environmental education programme have been enhanced. The Environmental Monitoring and Evaluation demonstration project aims to establish the basis for joint monitoring of the Gulf of Mexico, based on the EPA-NOAA-U.S.GS National Condition Index programme. It adapted some of the indicators to the conditions of the Southern Gulf. The approach used by the project includes probabilistic sampling (robust and scientifically defensible) and a strong quality assurance and control (QA/QC) component.

The GoM LME Project also addresses the interaction between the natural environment and human activities through environmental education strategies. The GoM LME, in collaboration with federal institutions, has conducted workshops on participatory planning to identify

alternative livelihoods, and provided lectures on environmental education to better understand and appreciate the GoM LME's living marine resources.

Different intersectorial regional coordination mechanisms have been established to support SAP implementation. For instance, the Mexican Consortium of Marine Research Institutions of the Gulf of Mexico (CiiMar-GoM) which includes participation of thirteen Mexican and one American institution was created to promote best management practices and sustainable development of the region through the provision of sound science and knowledge. Coordination of CiiMar-GoM with the seventy eight public and private institutions of the Gulf of Mexico University Research Collaborative (GOMURC) will result in joint projects.

Other major problems in the Gulf of Mexico include inadequate waste drain systems and the large amounts of fertilizers and herbicides from agricultural activities that rivers deposit in the sea creating "dead zones" of low oxygen that affect marine life. Within the framework of inter-sectoral coordination in the implementation phase, the GoM-LME project through the SAP will promote links with the private sector and NGOs through lines of action and specific priority actions addressing schemes of collaboration with agribusiness, fisheries and energy sectors in the context of ecosystem-based management.

The Environmental Educators Alliance in Mexico involves the work of 42 institutions including universities, federal and state governments, and non-governmental organizations (NGOs). The Alliance includes 6 state committees with one regional committee underway. In the U.S. the Gulf of Mexico Governors Alliance (GOMA) works with about 40 state government agencies, 13 federal agencies, and 36 NGOs. This collaborative effort is one more example of coordinated work to promote environmental education in the region.

An International Gulf of Mexico Marine Protected Areas Network (IGOMMPAN) was established to ensure coastal and marine ecosystem and biodiversity connectivity of the Gulf of Mexico and a complementary Gulf of Mexico LME Sister Sanctuary Network is currently underway.

To consolidate the observation and monitoring of the Gulf of Mexico's ocean and coastal conditions a binational network was established that includes the Gulf of Mexico Ocean Observing System (GCOOS) and the Harmful Algal Bloom Integrated Observing System (HABIOS). The work undertaken has been enhanced with participation of both state and federal public health laboratories and ministries of Health, the Navy and several academic institutions in all Mexican Gulf coastal states.

Additionally, significant progress is also evident in regional network efforts on climate change issues. A binational network of experts and projects working to increase the capacities of coastal - marine researchers, students, and GIS specialists to implement modern tools to assess sea level rise impacts on coastal habitats and human communities will support decision-making processes.

2 Steps towards the Preparation of the Strategic Action Programme

2.1 The Gulf of Mexico LME TDA

The primary supporting document for the SAP is the Transboundary Diagnostic Analysis (TDA), endorsed by both **SEMARNAT** and **NOAA**. Generated with the input of scientists, managers and civil society representatives, the TDA is a scientific and technical assessment that summarizes U.S. and Mexican views regarding the top priority transboundary issues the two countries face in the GoM LME.

The TDA determined the baseline to address priority transboundary issues in the Gulf of Mexico region, and became an essential document to establish the immediate and long-term actions to influence the sectorial policies or activities and represented the basis for establishing the commitment of both nations, Mexico and the United States, to maintain a healthy and productive Gulf of Mexico Large Marine Ecosystem.

The TDA provides structured information in relation to the magnitude, the relative importance of the causes and origins of transboundary problems, and the basis for the identification of preventive and corrective lines of action to ensure the integrated and sustainable management of this Large Marine Ecosystem. The TDA provides the technical basis for the development of this Strategic Action Program (SAP).

In order to develop a Strategic Action Programme (SAP) fully congruent with GEF approaches, the project aims to develop a SAP and NAPs that outline the key transboundary environmental problems in the GoM LME, by addressing the underlying socio-economic and 'root causes'. The three transboundary environmental problems identified in the TDA were:
1. Pollution including eutrophication and harmful algal blooms (HABs);
2. Habitat modification (wetland loss, connectivity, loss of resilience); and
3. Overfishing of shared, migratory and connected fish stocks.

Each transboundary problem with its associated root causes is described in more detail in Annex 1.[3]

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[3] Annex 2. GoM LME transboundary issues linked through a TDA-SAP relationship matrix.

2.2 The Preparation of the Gulf of Mexico LME SAP

During preparation of the GoM LME SAP, one of the purposes was to establish clear priorities for action by both countries (for example, policy, legal, institutional reforms, or investments) to resolve the priority transboundary problems identified in the TDA. The GoM LME SAP was developed with full consensus between both participating countries through a series of steps outlined below:

1. A SAP draft document was presented in January 2012 by the GoM LME Project Coordination Unit taking into account documents such as the GoM LME's TDA, the U.S. Gulf of Mexico Ecosystem Restoration Task Force's "Gulf of Mexico Ecosystem Assessment and Science Needs", GOMA's Governors Action Plan, and SEMARNAT's Regional and Marine Use Planning Programme for the Gulf of Mexico and the Caribbean Sea.

2. A critical roadmap was proposed by the Project Coordination Unit and endorsed by the Steering Committee at its 4th Meeting (March 13-15, 2012).

3. A binational working group was integrated with representatives from federal government offices of Mexico and the United States dealing with issues related to the SAP and knowledge of the law and institutional processes:

   Mexico
   - Ministry of Foreign Affairs
   - Ministry of Environment and Natural Resources
   - Ministry of the Navy
   - National Institute for Fisheries
   - National Commission for Water

   United States
   - Environmental Protection Agency
   - National Oceanic and Atmospheric Administration

   This group defined the priorities to be included in the SAP. Feedback took place through conference calls attended by the technical focal points. Specific observations and comments were provided by the transboundary working group and integrated into a new SAP document with the agreed priorities.

4. A meeting among the countries' technical focal points and UNIDO Manager took place on July 5-6, 2012 in Paris, where decision was reached to adopt a "strategic areas" approach to develop the SAP.

5. A first group meeting was held October, 2012 in Houston, TX to analyze, discuss and develop the SAP final document. Decision was reached to continue using the established strategic areas and action lines approach.

6. A second group meeting was held November 2012 in Merida, Yucatan at the 5th Steering Committee Meeting to adjust the final document and define the endorsement mechanism.

7. Final reviews, adjustments and definition and inclusion of targets and indicators were made by working groups.

8. Governments officially endorsed the SAP on **DD/MM/YY**

3. IMPLEMENTATION OF THE GOM LME STRATEGIC ACTION PROGRAMME

3.1 Challenges Facing the GoM LME SAP

The purpose of the GoM LME SAP is to identify concrete actions, individually and collectively, both at a national, sub-regional and regional level to guarantee transboundary cooperation and the Integrated Assessment and Management of the Gulf of Mexico Large Marine Ecosystem in keeping with the following general guidelines:

1. The concept of sustainable development should be used in a manner that guarantees the use and enjoyment by future generations of the GoM and does not compromise the health of the GoM LME ecosystems.

2. Preventive actions should start with cooperation between the two countries, taking into consideration impacts of political decisions, programmes, and plans.

3. The use of clean technologies should be promoted in the addressing of problems related to the ecosystem, gradually replacing the technologies currently in use that generate large quantities of waste.

4. The use of economic instruments and policies to accelerate sustainable development should be promoted, such as the application of economic incentives for the use of technologies and practices that are respectful of the environment.

5. Consideration for the health of humans and ecosystems should be promoted in the main sectoral policies and development plans of the countries, especially those relating to industrial development, fishing and aquaculture, coastal development, and maritime transport.

6. Participation and cooperation of the private sector should be encouraged and considered as an integral part of the successful management and implementation of the SAP.

7. Promoting transparency, public participation and cooperation are tasks of the GoM-LME that should be encouraged through wide dissemination of information in order to improve integrated sustainable management.

In working collectively to design and implement concrete actions for the protection and conservation of the GoM LME living marine resources, the U.S. and Mexico recognize the following challenges:

- **Control and reduce pollution:** Reduce and control nutrient over-enrichment, HABs and areas of hypoxia.
- **Recovery of living marine resources:** Achieve sustainable management and use of living marine resources, and work towards rebuilding overfished stocks.
- **Rehabilitation of marine & coastal ecosystems.** Conserve biodiversity and habitats in marine and coastal ecosystems through regional cooperation and development of management plans while strengthening collaborations among multiple users of marine and coastal habitats to address these challenges.

3.2   Vision for the Gulf of Mexico LME

Through the Strategic Action Programme, the participating countries in the GoM LME region are adopting the following long-term vision:

> "A healthy and resilient Gulf of Mexico where coastal communities enjoy high standards of quality of life and the region's socio - economic activities are competitive and sustainable. Likewise, the region's natural resources, biophysical structure and landscape quality provide environmental services that halt threats and reduce vulnerability of the population and infrastructure".

3.3   Strategic Areas for the Gulf of Mexico

This SAP presents 71 priority actions, negotiated by **NOAA** and **SEMARNAT**, which will contribute to achieving the long-term vision. In identifying the actions, both agencies recognize the importance of promoting the improvement of general social and economic welfare. All the work related to the SAP considers that the health of coastal societies and their economies are directly related to the health of coastal and marine ecosystems.

The SAP responds to the GoM LME Transboundary Diagnostic Analysis, which identifies the priority environmental transboundary problems summarized in Annex 2 and sets the basis for identifying remedial priority actions.

This corresponds to the desired status of the GoM LME, which is to be reached through the achievement of five medium-term (5 years) ecosystem quality strategic areas and one cross cutting strategic area. These are listed below and presented in more detail in Annex 3.

3.3.1 GoM LME SAP OBJECTIVES AND STRATEGIC DIRECTIONS

Long-Term Objectives for the GoM LME

The SAP adopts the following broad, long-term Ecosystem Quality Objective (EcoQO) for the marine environment of the GoM LME:

"Improve water quality; enhance economic vitality by avoiding depletion and recover living marine resources; and conserve and restore coastal and marine ecosystems"

Achieving this EcoQO will allow the Region to ensure the following Societal Benefits (SBO):

"The provision of goods and services by the marine ecosystems of the GoM LME are such that they optimize the systems' contributions to societal well-being and to the region's development needs" (including the preservation of aesthetic, cultural, traditional, health and scientific values of the ecosystems)

Ecosystem-Specific Objectives and Societal Benefits

More specific Ecosystem Quality Objectives (EcoQOs) are adopted for the three key strategic areas that support the most important living marine resources, biodiversity and habitat in the GoM LME.

The EcoQO to Improve Water Quality is formulated as:

"Establish strategies and actions for the reduction and control of nutrient over-enrichment, harmful algal blooms and for the elimination of dead zones"

The priority transboundary issues that are most relevant to this EcoQO are: habitat alteration and/or loss; eutrophication and hypoxia; effects from hydrocarbons, pesticides, metals, emergent pollutants; and floating marine debris, especially plastics.

The following two interlinked EcoQOs are applicable to two, high-priority transboundary issues: "enhance economic vitality, by avoiding depletion", and "recover and increase living marine resources and associated ecosystems",

"Establish LME-wide strategies for conserving biodiversity and habitats in the coastal zones of GoM LME supported and harmonized at a regional level".

The identified priority transboundary issues most relevant to this EcoQO are: unsustainable fisheries and habitat degradation and modification of ecosystem communities.

"Safeguarding the habitats and community structure of the ecosystems from harmful impacts -including those caused by fisheries and pollution- that would diminish the contributions of these systems for enhancing livelihoods and human well-being"

All three EcoQOs are linked to, and are essential for the achievement of the following associated Societal Benefits Objective:

"Contributions to human well-being, socio-economic development, food security and enhanced livelihoods from goods and services provided by the ecosystems are optimized"

3.3.2 Ecosystem Quality Strategic Area I - Improve Water Quality

The conditions of coastal waters in the GoM LME are a reflection of the changes in the natural hydrology and pollution from urban development, industry, agricultural runoff, atmospheric deposition and other sources across the Gulf basin. The SAP will support these efforts through understanding and improving management practices to reduce pollution.

Objective: Establish strategies and actions for the reduction and control of nutrient over-enrichment, HABs and for the elimination of dead zones.

Target	Indicator
Increase wastewater treatment.	Wastewater treated/total of wastewater (other indicators: number of wastewater discharges; number of wastewater treatment plants; DBO5; SST; reduction of nutrients from the watersheds; decrease of agrochemicals)
Formulate or implement four legal, policy or planning instruments related to reduce water pollution.	Number of legal, policy, planning or monitoring instruments related to water pollution reduction (number of sites monitored; flow that meets ecological objectives; surface and underground water availability calculations; waste management; water reserves) Number of formulated or implemented instruments/. programmed mean planned instruments

Action line I.A Reduce Pollution

Priority Actions

1. Promote best management practices for use of pesticides and fertilizers in agricultural activities to reduce inputs of nutrients and agrochemicals to coastal waters.

2. Promote sustainable practices in the design and operations of sewage and waste management and treatment systems.

3. Prevent, identify, monitor and promote the mitigation of environmental impacts resulting from urban and industrial pollutants.

4. Expand existing and develop new partnerships to raise awareness of the extent of pollution impacts, including marine debris, on the health and productivity of the marine environment and implications for economic loss.

5. Promote expansion and integration of a regional monitoring and information gathering system for harmful algal blooms.

6. Promote the development of indicators of water quality in the region, especially in coastal areas, to assess their status and evolution.

7. Promote the establishment of quality goals in the medium and long term.

Action line I.B Improve Management Practices

Priority Actions

1. Promote integrated watershed management, cumulative impact evaluations, and environmentally sound waste management.

2. Promote sustainable practices related to oil and gas exploration and development.

3. Cooperate to implement joint prevention and cleanup programmes to reduce marine debris.

4. Develop and implement nutrient reduction plans and best management practices for river discharges into the Gulf.

5. Promote study, conservation, and reuse of sediments (e.g. wetland creation from dredged sediments).

3.3.3 Ecosystem Quality Strategic Area II - Avoid depletion and recover degraded living marine resources

More than 300 species sustain local fisheries in the GoM LME (including fishes, crustaceans, mollusks, echinoderms and other invertebrates). However, many stocks in the Gulf of Mexico are over-fished, or are at or near their maximum yield. Depletion of fish stocks affects both countries because many stocks are transboundary, migratory, or connected via egg or larval transport.

Objective: Establish strategies and actions formulated for sustainable management and use of exploited living marine resources, and for the recovery of depleted fish stocks to within safe biological limits.

Target	Indicator
Manage fishing effort.	Number of fishing vessels decreased or maintained at sustainable levels. Other indicators include: Percentage of stocks subject to overfishing; Percentage of by-catch of target and non-target species.
Formulate or implement seven legal, policy or planning instruments related to fish or aquaculture management.	Number of legal, policy or planning instruments related to fish or aquaculture management (aquaculture and fisheries management programs; update of the national fisheries chart; restoration programs, implementation of the model developed from the first phase of the LME project) Number of formulated or implemented instruments/ programmed mean planned instruments

Action line II.A Identify Priority Areas for Maintenance of Biodiversity

Priority Actions

1. Establish area-based measures, such as marine protected areas and networks and fishery refuges, and integrate them through ecosystem based management at the Gulf-wide level.

Action line II.B Promote Sustainable Fisheries

Priority Actions

1. Work cooperatively to recover depleted transboundary fish stocks and other living marine resources.

2. Improve habitats and environmental conditions that support fishery production.

3. Cooperate in information exchange and stock assessments.

4. Honor the FAO Code of Conduct for Responsible Fisheries and associated FAO International Plans of Actions (IPOAs), endorsed by Mexico and the U.S.

5. Increase the capacity of management agencies to recover depleted living marine resources.

6. Evaluate the performance and effects of fishing subsidies promoting sustainability and avoiding over-capacity and over-fishing.

7. To the extent permitted by applicable US and Mexican domestic laws, exchange information and conduct cooperative research to better understand how estuarine habitats and inshore environmental conditions are linked to fishery production.

8. Identify factors and share experiences on best practices to help sustain fishery production.

9. Promote bilateral cooperation for adaptation of fisheries and fisheries management to climate change based on information, maps and models of its potential effects on marine productivity and ecosystems.

Action line II.C Utilize Traditional Ecological Knowledge

Priority Actions

1. Improve understanding and acceptance of local traditions related to resource use and management.

2. Facilitate the exchange of experiences and practices between resource users from both countries.

3.3.4 Ecosystem Quality Strategic Area III - Conserve and Restore Coastal and Marine Ecosystems

Trends of increasing urban growth are occurring at the expense of sand dunes, estuaries, marshes, sea grasses, coral reefs, mangroves and other critical habitats.

Objective: Establish LME-wide strategies for conserving biodiversity and habitats in the coastal zones of GoM LME supported and harmonized at a regional level.

Target	Indicator
Restore 3,000 ha of wetland.	Wetlands surface restored Number of hectares restored/ Number of hectares planned
Formulate or implement five legal, policy or planning instruments related to coastal and marine ecosystems conservation	Number of legal, policy or planning instruments related to coastal and marine ecosystems conservation (national protected areas, RAMSAR sites; twining programs; land and sea use plans; wildlife management programs; biodiversity strategies; red tide prevention, prediction and mitigation; implementation of the recommendations developed during the LME project). Number of formulated or implemented instruments / Number of programmed instruments
Identify and reduce impacts of invasive species.	Invasive species control program or specific actions at key sites

Action line III.A Promote Restoration of Natural Processes in the Watersheds

Priority Actions

1. Support community-based habitat restoration projects and initiatives.

2. Promote efforts to address erosion, such as living shorelines, expansion and conservation of forest cover and the use of conservation tillage in basins that discharge into the Gulf of Mexico.

3. Restore natural hydrologic processes.

Action line III.B Protect Marine and Coastal Connectivity

Priority Actions

1. Strengthen the effectiveness of marine protected areas by linking them into networks.

2. Reduce habitat loss and fragmentation.

Action line III.C Promote Community-Based Conservation programmes

Priority Actions

1. Utilize good natural resource conservation management practices.

2. Develop effective education and outreach programmes.

3. Reduce destructive land use practices and promote land uses that preserve the natural coastal ecosystems.

4. Promote urban and coastal development projects and related land-reclamation activities, carried out in a responsible manner that protects the marine environment.

Action line III.D Reduce Invasive Species Impacts

Priority Actions

1. Collaborate on development of a public regional invasive species database that includes information on potential risks and threats associated with each species.

2. Establish a joint invasive species control programme at key sites or during life stages where control can have a measurable benefit on the ecosystem.

3. Develop and implement an education plan (including a best practices manual) to raise the awareness of the threats posed by invasive alien species.

4. Increase the understanding of pathways of invasive species colonization, including climate change scenarios and collaborate on promoting improvements to the effective management of those pathways.

Action line III.E Promote Community Resilience and Sustainable Livelihoods

Priority Actions

1. Contribute to protecting human life, public and private property.

2. Promote *green growth* development.

3. Promote awareness of cultural values and traditional livelihoods.

3.3.5 Ecosystem Quality Strategic Area IV - Mitigate and Adapt to Climate Change and Sea Level Rise

The GoM LME will continue to be impacted by climate change and its associated effects such as variation in ocean temperature, sea level rise, ocean acidification, and changes in storm and rainfall patterns. Therefore, the design and implementation of common policies and strategies that address the anticipated impacts from climate change will be a critical component of efforts to strengthen the resiliency of coastal communities.

Objective: Strengthen local capacities through binational actions in order to address climate-related issues.

Target	Indicator
Decrease vulnerability and risk associated to climate change	% of areas, population or ecosystems with risk reduction
Formulate or implement five legal, policy or planning instruments related to climate change	Number of legal, policy or planning instruments related to climate change (Climate Change State Action Programs; Climate Change Special Program; national and municipal atlas) Number of formulated or implemented instruments / Number of programmed instruments

Action line IV.A Document potential impacts from climate change on the GoM LME

Priority Actions

1. Develop and, to the extent permitted by applicable U.S. and Mexican domestic laws, exchange information, maps, and models of the potential impacts from climate change

(sea level rise, ocean acidification, storms, floods, etc) on GoM living marine resources and ecosystems and coastal communities, including carrying capacity and community resilience.

2. Promote understanding of the causes of and impacts from climate change (i.e., sea level rise, ocean acidification, changing storm frequency/magnitude/extent/duration changing precipitation patterns) and develop common transboundary strategies to jointly confront its effects.

3. Support efforts to improve coastal nearshore and terrestrial mapping and modeling to develop a better understanding of sea level rise, flooding, and climate change impacts.

4. Support scientific collaboration to better understand potential land use and coastal ecosystem changes associated with climate changes and sea level rise.

Action line IV.B Support community adaptation to climate change and sea level rise.

Priority Actions

1. Promote actions to assess, adapt to and reduce vulnerability to sea level rise.

2. Enhance early warning systems that allow coastal communities more time to react to potential disasters.

3. Promote, exchange and disseminate integral risk management practices, approaches and models.

4. Generate coordinated disaster response plans among various levels of government and among various stakeholders.

3.3.6 Ecosystem Quality Strategic Area V - Improve Science Education and outreach

Improve Science Education and Outreach- Public participation and greater understanding of the social, cultural and scientific elements of the GoM LME will enhance regional cooperation and partnership.

Objective: Strengthen communication and dissemination activities to raise awareness of the importance of the ecosystem and promote greater participation of society and communities in efforts to conserve and protect the Gulf.

Target	Indicator
Consolidate the Environmental Educators Alliance and the Consortium of Research Institutions of the Gulf of Mexico as independent entities.	A consolidated Environmental Educators Alliance.
Create or implement 5 national and/or binational environmental education regional programs.	A Consolidated Consortium of Research Institutions of the Gulf of Mexico. Number of created or implemented national and/or binational regional programs / Number of programmed programs.
Increase understanding and use of climate, ocean and coastal environmental information.	Number of workshops, conferences (other indicators: use of the results of the LME project in decision making; number of graduates in marine disciplines; capacity building) Number of workshops and conferences held/ Number of programmed workshops.

Action line V.A Communicate and Disseminate the Goals and Results of the GoM LME project

Priority Actions

1. Identify target audiences.

2. Expand classroom and field-based education through both formal and informal methods.

3. Promote education and training of students at all levels in ecosystem science and ecosystem-based management to increase capacity in fields that support the goals and objectives of the SAP. Encourage university exchanges between institutes in the U.S. and Mexico.

4. Improve access to scientific knowledge by resource managers and decision makers.

3.3.7 Cross-Cutting Strategic Areas

This section describes a series of cross-cutting issues that take into account the high connectivity between environmental issues in the GoM LME and the need for an Ecosystem Based Management approach.

Objective: Improved institutional structure to address priority regional problems, including an appropriate regional coordination mechanism, and other regional and national bodies for conducting effective regional interventions to sustain living marine resources, conserve coastal and marine ecosystems and improve water quality.

3.3.7.1 Cross-Cutting Strategic Area VI.I Promote compliance with existing institutional, policy and legal arrangements

Enhanced cooperation among institutions would enhance understanding of policy issues and laws at the regional level.

Target	Indicator
Improve inspection and surveillance actions	Number of inspection and surveillance actions by federal, state and municipal authorities (an additional indicator is the number of inspections where full compliance or a percentage of compliance was found)

Action line VI.I.A Strengthen institutional cooperation for regional planning

Priority Actions

1. To the extent permitted by applicable U.S. and Mexican domestic laws, share information about ecosystem-based approaches and consider technical issues, data compatibility and evaluation methodology.

2. Develop a Protected Areas Network and other conservation policy tools and instruments to support efforts for conservation of ecosystems.

3. Facilitate inter-agency coordination and identify additional sources of financial support for regional planning.

3.3.7.2 Cross-Cutting Strategic Area VI.II Promote integrated management processes for the implementation of the actions

Integrated management would seek to enhance strategic partnerships and would facilitate better decision-making processes.

Target	Indicator
Conduct two exchange mechanisms to discuss ecosystem goods and services and environmental impact evaluation practices.	Number of bi-national workshops, conferences and other exchange mechanisms

Implemented/ Number of bi-national workshops, conferences and other exchange mechanisms programmed |

Action line VI.II.A Utilize Ecosystem Based Management

Priority Actions

1. Promote the evolution from single-species, single-habitat, and sectoral approaches to a more integrated ecosystem approach to science and management.

2. Quantify the value of the existing ecosystem goods and services.

3. Identify common environmental quality objectives and goals.

4. Participate in Integrated Ecosystem Assessment efforts underway in the GoM by identifying ecosystem services, indicators, and drivers related to productivity of living marine resources.

5. Contribute information and assist in the development of GoM ecosystem models such as Ecopath with Ecosim; Atlantis; or others.

6. Exchange experiences on environmental impact assessment practices relating to infrastructure projects in sensitive habitats.

3.3.7.3 Cross-Cutting Strategic Area VI.III Create monitoring and evaluation indicators pursuant to GEF guidelines to measure success and progress to reach goals

Indicators recommended by GEF would promote accountability, sharing results and lessons learned as a basis for decision-making.

Target	Indicator
Increase monitoring sites with National Coastal Condition methodology.	Number of additional monitoring sites / Number of programmed monitoring sites.
Design and/or implement five monitoring strengthening actions	Number of monitoring strengthening actions (capacity-building, courses, infrastructure –buoys, laboratories; data collection; technical assistance)

	Number of designed or implemented actions / Number of programmed actions.

Action line VI.III.A Monitor ecosystem responses to programmatic action

Priority Actions

1. Conduct a gap analysis by identifying and evaluating existing monitoring efforts.

2. Build upon existing monitoring efforts to meet programme needs.

3. Decide on baseline information and a networking system based on related existing initiatives.

Action line VI.III.B Conduct programmatic reviews.

Priority Actions

1. Establish and implement protocols for periodic programme reviews.

3.3.7.4 Cross-Cutting Strategic Area VI.IV Enhance information and knowledge exchange and promote awareness and participation

Sound policies and management of the GoM LME transboundary region would be conducted based on the best available science and public participation.

Target	Indicator
Design and/or implement five mechanisms to disseminate information and promote awareness about the LME	Number of mechanisms (Other indicators: number of geoportals; information on the project´s webpage) Number of designed or implemented mechanisms / Number of programmed mechanisms.
Conduct five studies related to the conservation of coastal and marine natural resources and monitoring of health ecosystems	Number of new studies related to the target Number of studies done / Number of programmed studies

Action line VI.IV.A Promote the use of sound science to better inform management decisions

Priority Actions

1. Promote enhanced understanding of oceans processes that contribute to the programme goals.

3.3.7.5 Cross-Cutting Strategic Area VI.V Incorporate sustainability, new technology and innovative economic instruments

Sustainable development would be pursued through economic instruments and new technologies.

Target	Indicator
Promote resources or actions related to green growth and or blue economy used for restoration of coastal ecosystems, pollution reduction and recovery of living marine resources	Amount of resources and actions Implemented/ Amount of resources and actions programmed

Action line VI.V.A Incorporate economic instruments and exchange of experiences

Priority Actions

1. Promote consultation with leading economists and social scientists and exchange of experiences to evaluate Gulf of Mexico ecosystems and promote coastal habitat and fisheries conservation.

2. Develop and promote the use of economic incentives and instruments to improve ecosystems, fisheries and living marine resources conservation.

3.3.7.6 Cross-Cutting Strategic Area VI.VI Consider and adapt to predicted climate change impacts

Risks and impacts associated with coastal hazards and vulnerability to changing climate conditions, such as sea level rise and other impacts would be better understood by coastal communities.

Target	Indicator
Design and/or implement five mechanisms to disseminate information and promote awareness about the LME	Number of mechanisms (Other indicators: number of geoportals; information on the project´s webpage*) Number of designed or implemented mechanisms / Number of programmed mechanisms.
Conduct five studies related to the conservation of coastal and marine natural resources and monitoring of health ecosystems	Number of new studies related to the target Number of studies done / Number of programmed studies

Action line VI.VI.A Promote adaptation actions

Priority Actions

1. Promote conservation of the structure and function of ecosystems that can not only improve the resilience of coastal communities, but also contribute to natural CO_2 sequestration (e.g., mangroves, sea grasses).   Seek out additional actions that provide mitigative and adaptive co-benefits.

2. Evaluate the impacts of future climate change on each strategic action and build in flexibility so the actions can respond and adapt to potential impacts.

4. TOWARDS THE IMPLEMENTATION OF THE GoM LME SAP

Each participating country intends to develop and implement a National Action Programme (NAP) during the second phase of the GoM LME Project, as part of the SAP implementation process, which provides a set of priority strategic actions according to the major transboundary environmental problems identified in the TDA.

The GoM LME NAPs will include the details of additional measures to be addressed by each country at the national level in accordance with the guidelines and priorities declared in the SAP. NAPs will include details of responsibilities and specific projects. The NAPs will also promote the identification of institutional frameworks for successful implementation of specific project funding needs.

The SAP becomes operative from the date of endorsement and ends five years from the operative date, unless either the United States or Mexico chooses no longer to participate in the SAP and so notifies the other in writing. The SAP may be reviewed periodically by the

United States and Mexico and revised or supplemented as appropriate. In the event any issues relating to the implementation of the SAP arise, either the United States or Mexico may request that the other enter into consultations with a view to resolving them.

5.   MONITORING AND EVALUATION

Measuring Progress and Results: Indicator Types

The development and execution of a Monitoring and Evaluation (M&E) Plan is an essential component of the GoM LME SAP to be jointly defined by both countries.

It is envisioned that the M&E Plan for GoM LME SAP implementation is to be composed of two elements: (a) ongoing monitoring of the progress obtained with regard to the progress in the implementation of the programme's Strategies, Actions and Activities; and (b) periodic evaluation of the programme's performance in terms of outputs produced and outcomes achieved, as well as in terms of the cost-effectiveness of actions. Both Monitoring and Evaluation would facilitate the adoption of an adaptive management approach to SAP implementation.

To ensure that progress in SAP implementation can be effectively monitored and evaluated, it is envisioned that early on in the SAP development and implementation phase, a full baseline is to be established for all indicators used to measure progress in the implementation of the SAP. This baseline would be the rubric against the future SAP implementation.

The following three types of M&E indicators for SAP implementation are typically used under GEF co-funded projects:

- *Process Indicators*

- *Stress Reduction Indicators*

- *Environmental Status Indicators*

Environmental status indicators track progress towards achieving the GoM LME SAP Ecosystem Quality Strategic Areas. Stress reduction indicators typically reflect how direct causes of environmental or ecosystem stress (e.g. direct causes of reduced fish stocks such as illegal or over-fishing) have been reduced or eliminated. However, as strategic actions under the SAP will often be directed towards addressing the root causes of the transboundary problems identified in the TDA (see Annex 2), it will take considerable amounts of time before structural changes become reflected in measurable reductions of stress at the GoM LME level, or in measurable changes in environmental and socio-economic conditions. In the meantime, process indicators reflect the progress being made towards implementing actions and activities required for such purposes.

ANNEX 1. ENDORSEMENT LETTERS

Note. This annex SAP endorsement letters from both countries will be included in the final edition

ANNEX 2. GoM LME transboundary issues linked through a TDA-SAP relationship matrix

TDA		SAP	
Transboundary Elements: While most sources and impacts are localized, the problems are common to both countries and require collective action to address			
Perceived Major Problem	**Major Root Causes**	**Line Action**	**Strategic Area**
1. Habitat Alteration and/or Loss 2. Eutrophication and hypoxia 3. Effects from hydrocarbons, pesticides, metals, emergent pollutants 4 Floating Marine Debris, especially plastics	*1. Insufficient water processing infrastructure included in sectorial planning*	*Reduce Pollution.* *Improve Management Practices.*	I. Improve Water Quality
		Strengthen institutional cooperation for regional planning.	VI.I. Ensure compliance with existing institutional, policy and legal arrangements.
	2. Incomplete pollution control	*Reduce Pollution.* *Improve Management Practices.*	I. Improve Water Quality
		Strengthen institutional cooperation for regional planning.	VI.I. Ensure compliance with existing institutional, policy and legal arrangements.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
	3. Ecosystem concerns not sufficiently considered in planning and management	*Reduce Pollution.* *Improve Management Practices.*	I. Improve Water Quality
		Protect Marine and Coastal Connectivity.	III. Conserve Coastal and Marine Ecosystems.
		Strengthen institutional cooperation for regional planning.	VI.I. Ensure compliance with existing institutional, policy and legal arrangements.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
	4. Planning and management done in a per-sector basis without proper accounting of externalities and natural limits of resources	*Reduce Pollution.* *Improve Management Practices.*	I. Improve Water Quality
		Strengthen institutional cooperation for regional planning.	VI.I. Ensure compliance with existing institutional, policy and legal arrangements.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
		Monitor ecosystem responses to programmatic action. *Conduct programmatic reviews.*	VI.III. Create monitoring and evaluation indicators pursuant to GEF guidelines to measure success and progress to reach goals.
	5. Capacity building not in pace with the need to address ecosystem, social or economic concerns	*Reduce Pollution.* *Improve Management Practices.*	I. Improve Water Quality
		Strengthen institutional cooperation for regional planning.	VI.I. Ensure compliance with existing institutional, policy and legal arrangements.
		Promote community resilience sustainable livelihoods.	III. Conserve Coastal and Marine Ecosystems.
		Develop joint research in accordance with applicable laws. *B. Communicate and disseminate the goals and of the LME program.*	V. Improve Science Education and Outreach.

TDA		SAP	
Transboundary Elements: Some species stocks are exploited by both countries. Overexploitation, overcapitalization are common concerns			
Perceived Major Problem	**Major Root Causes**	**Line Action**	**Strategic Area**
1. Non-integrated / conflicting / inadequate fisheries management strategies and capabilities among countries	*1. Ecosystem concerns not sufficiently considered in planning and management*	*Identify priority areas for maintenance of biodiversity.* *Promote Sustainable Fisheries* *Utilize traditional ecological knowledge.*	II. Avoid depletion and recover depleted living marine resources
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
		Incorporate economic instruments and exchange of experiences.	VI.V. Incorporate sustainability, new technology and innovative economic instruments.
	2. Planning and management done in a per-sector basis without proper accounting of externalities and natural limits of resources	*Identify priority areas for maintenance of biodiversity.* *Promote Sustainable Fisheries* *Utilize traditional ecological knowledge.*	II. Avoid depletion and recover depleted living marine resources
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
		Incorporate economic instruments and exchange of experiences.	VI.V. Incorporate sustainability, new technology and innovative economic instruments.
	3. Capacity building not in pace with the need to address ecosystem, social or economic concerns	*Identify priority areas for maintenance of biodiversity.* *Promote Sustainable Fisheries* *Utilize traditional ecological knowledge.*	II. Avoid depletion and recover depleted living marine resources
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
		Incorporate economic instruments and exchange of experiences.	VI.V. Incorporate sustainability, new technology and innovative economic instruments.
	4. Fishing effort entry controls not effective enough	*Identify priority areas for maintenance of biodiversity.* *Promote Sustainable Fisheries* *Utilize traditional ecological knowledge.*	II. Avoid depletion and recover depleted living marine resources
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
		Incorporate economic instruments and exchange of experiences.	VI.V. Incorporate sustainability, new technology and innovative economic instruments.

TDA	SAP		
Transboundary Elements: The effects of Climate Change are global in nature. Both countries' coastal areas in the Gulf share a relatively flat topography, rapid rates of land subsidence, extensive shoreline development, and exposure to major storms.			
Perceived Major Problem	**Major Root Causes**	**Line Action**	**Strategic Area**
1. Climate Change effects	*1. Ecosystem concerns not sufficiently considered in planning and management*	*Document potential consequences of climate change on the GoM-LME ecosystem.* *Support community preparation for climate change and sea level rise*	IV. Mitigate and Adapt to Climate Change and Sea Level Rise.
	2. Planning and management done in a per-sector basis without proper accounting of externalities and natural limits of resources	*Promote adaptation actions.*	VI.VI. Consider and adapt to predicted climate change impacts.

TDA **Transboundary Elements:** Ecosystem-wide connectivity requires involvement from both countries		SAP	
Perceived Major Problem	**Major Root Causes**	**Line Action**	**Strategic Area**
1. Incomplete information and understanding of ecosystem functioning	*1. Insufficient water processing infrastructure included in sectoral planning*	*Protect Marine and Coastal Connectivity.*	III. Conserve Coastal and Marine Ecosystems.
		Communicate and disseminate the goals and results of the LME program.	V. Improve Science Education and outreach.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
	2. Incomplete pollution control	*Protect Marine and Coastal Connectivity.*	III. Conserve Coastal and Marine Ecosystems.
		Communicate and disseminate the goals and results of the LME program.	V. Improve Science Education and outreach.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
	3. Ecosystem concerns not sufficiently considered in planning and management	*Protect Marine and Coastal Connectivity.*	III. Conserve Coastal and Marine Ecosystems.
		Communicate and disseminate the goals and results of the LME program.	V. Improve Science Education and outreach.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
	4. Capacity building not in pace with the need to address ecosystem, social or economic concerns	*Protect Marine and Coastal Connectivity.*	III. Conserve Coastal and Marine Ecosystems.
		Communicate and disseminate the goals and results of the LME program.	V. Improve Science Education and outreach.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.

TDA	SAP		
Transboundary Elements: Currently, the inadequacy of the evaluations of ecosystems services makes it challenging to make decisions about proper trade-offs when considering management actions around the Gulf.			
Perceived Major Problem	**Major Root Causes**	**Line Action**	**Strategic Area**
1. Difficulty in assigning value for ecosystem services	*1. Insufficient water processing infrastructure included in sectoral planning*	*Promote restoration of natural processes in the watersheds* *Protect Marine and Coastal Connectivity.* *Promote Community-Based Conservation Programs.* *Promote community resilience sustainable livelihoods.*	III. Conserve Coastal and Marine Ecosystems.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
		Ensure that management decisions are better informed by science. *Ensure sustained support from engaged stakeholders*	VI.IV. Enhance information and knowledge exchange and promote awareness and participation.
		Ensure that management decisions are better informed by science. *Incorporate economic instruments and exchange of experiences.*	VI.V. Incorporate sustainability, new technology and innovative economic instruments.
	2. Ecosystem concerns not sufficiently considered in planning and management	*Promote restoration of natural processes in the watersheds* *Protect Marine and Coastal Connectivity.* *Promote Community-Based Conservation Programs.* *Promote community resilience sustainable livelihoods.*	III. Conserve Coastal and Marine Ecosystems.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
		Ensure that management decisions are better informed by science. *Ensure sustained support from engaged stakeholders*	VI.IV. Enhance information and knowledge exchange and promote awareness and participation.
		Ensure that management decisions are better informed by science. *Incorporate economic instruments and exchange of experiences.*	VI.V. Incorporate sustainability, new technology and innovative economic instruments.
	3. Planning and management done in a per-sector basis without proper accounting of externalities and natural limits of resources	*Promote restoration of natural processes in the watersheds* *Protect Marine and Coastal Connectivity.* *Promote Community-Based Conservation Programs.* *Promote community resilience sustainable livelihoods.*	III. Conserve Coastal and Marine Ecosystems.

TDA		SAP	
Transboundary Elements: Currently, the inadequacy of the evaluations of ecosystems services make it challenging to make decisions about proper trade-offs when considering management actions around the Gulf.			
Perceived Major Problem	**Major Root Causes**	**Line Action**	**Strategic Area**
Difficulty in assigning value for ecosystem services	*4. Planning and management done in a per-sector basis without proper accounting of externalities and natural limits of resources*	*Utilize Ecosystem Based Management.*	VI.II. Promote integrated management processes for the implementation of the actions.
		Ensure that management decisions are better informed by science. *Ensure sustained support from engaged stakeholders*	VI.IV. Enhance information and knowledge exchange and promote awareness and participation.
		Ensure that management decisions are better informed by science. *Incorporate economic instruments and exchange of experiences.*	VI.V. Incorporate sustainability, new technology and innovative economic instruments.
	5. Capacity building not in pace with the need to address ecosystem, social or economic concerns	*Promote restoration of natural processes in the watersheds* *Protect Marine and Coastal Connectivity.* *Promote Community-Based Conservation Programs.*	III. Conserve Coastal and Marine Ecosystems.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
		Ensure that management decisions are better informed by science. *Ensure sustained support from engaged stakeholders*	VI.IV. Enhance information and knowledge exchange and promote awareness and participation.
		Ensure that management decisions are better informed by science. *Incorporate economic instruments and exchange of experiences.*	VI.V. Incorporate sustainability, new technology and innovative economic instruments.
	6. More precise legal and technical definitions are needed to adopt the Ecosystem-Based Management approach as a common strategy.	*Promote restoration of natural processes in the watersheds* *Protect Marine and Coastal Connectivity.* *Promote Community-Based Conservation Programs.*	III. Conserve Coastal and Marine Ecosystems.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
		Ensure that management decisions are better informed by science. *Ensure sustained support from engaged stakeholders*	VI.IV. Enhance information and knowledge exchange and promote awareness and participation.
		Ensure that management decisions are better informed by science. *Incorporate economic instruments and exchange of experiences.*	VI.V. Incorporate sustainability, new technology and innovative economic instruments.

TDA		SAP	
Transboundary Elements: To different degrees, within each country, this is a problem shared by both countries. Equivalent agencies in each country could exchange information and experiences to a higher degree.			
Perceived Major Problem	**Major Root Causes**	**Line Action**	**Strategic Area**
1. Insufficient coordination between governmental agencies	*1. Ecosystem concerns not sufficiently considered in planning and management*	*Strengthen institutional cooperation for regional planning.*	VI.I. Ensure compliance with existing institutional, policy and legal arrangements.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
	2. Planning and management done on a per-sector basis without proper accounting of externalities and natural limits of resources	*Strengthen institutional cooperation for regional planning.*	VI.I. Ensure compliance with existing institutional, policy and legal arrangements.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
	3. Capacity building not in pace with the need to address ecosystem, social or economic concerns	*Strengthen institutional cooperation for regional planning.*	VI.I. Ensure compliance with existing institutional, policy and legal arrangements.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
	4. More precise legal and technical definitions would facilitate adoption of the Ecosystem-Based Management approach as a common strategy.	*Strengthen institutional cooperation for regional planning.*	VI.I. Ensure compliance with existing institutional, policy and legal arrangements.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.

TDA		SAP	
Transboundary Elements: Although in different degrees this shortage occurs in both countries. A proper information exchange and the definition of joint or harmonized management strategies are predicated on a strong human capital in both countries.			
Perceived Major Problem	**Major Root Causes**	**Line Action**	**Strategic Area**
1. Shortage of specialists to support assessment/monitoring and decision making (like population dynamics experts, ecosystem modelers, environmental and resource economists, etc)	*1. Ecosystem concerns not sufficiently considered in planning and management*	*Utilize Ecosystem Based Management.*	VI.II. Promote integrated management processes for the implementation of the actions.
		Monitor ecosystem responses to programmatic action. Conduct programmatic reviews.	VI.III. Create monitoring and evaluation indicators pursuant to GEF guidelines to measure success and progress to reach goals.
		Ensure that management decisions are better informed by science. *Ensure sustained support from engaged stakeholders*	VI.IV. Enhance information and knowledge exchange and promote awareness and participation.
		Ensure that management decisions are better informed by science. *Incorporate economic instruments and exchange of experiences.*	VI.V. Incorporate sustainability, new technology and innovative economic instruments.
	2. Capacity building not in pace with the need to address ecosystem, social or economic concerns	*Utilize Ecosystem Based Management.*	VI.II. Promote integrated management processes for the implementation of the actions.
		Monitor ecosystem responses to programmatic action. Conduct programmatic reviews.	VI.III. Create monitoring and evaluation indicators pursuant to GEF guidelines to measure success and progress to reach goals.
		Ensure that management decisions are better informed by science. *Ensure sustained support from engaged stakeholders.*	VI.IV. Enhance information and knowledge exchange and promote awareness and participation.
		Ensure that management decisions are better informed by science. *Incorporate economic instruments and exchange of experiences.*	VI.V. Incorporate sustainability, new technology and innovative economic instruments.

TDA	SAP		
Transboundary Elements: Ecosystem Based Management has yet to be established and implemented in a standardized way within and among countries.			
Perceived Major Problem	**Major Root Causes**	**Line Action**	**Strategic Area**
1. EBM concepts have yet to be explained and disseminated	*1. Insufficient water processing infrastructure included in sectoral planning*	*Communicate and disseminate the goals and results of the LME program.*	V. Improve Science Education and outreach.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
	2. Ecosystem concerns not sufficiently considered in planning and management	*Communicate and disseminate the goals and results of the LME program.*	V. Improve Science Education and outreach.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
	3. Planning and management done in a per-sector basis without proper accounting of externalities and natural limits of resources	*Communicate and disseminate the goals and results of the LME program.*	V. Improve Science Education and outreach.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
	4. Capacity building not in pace with the need to address ecosystem, social or economic concerns	*Communicate and disseminate the goals and results of the LME program.*	V. Improve Science Education and outreach.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.
	5. More precise legal and technical definitions would facilitate adoption of the Ecosystem-Based Management approach as a common strategy.	*Communicate and disseminate the goals and results of the LME program.*	V. Improve Science Education and outreach.
		Utilize Ecosystem Based Management.	VI.II. Promote integrated management processes for the implementation of the actions.

ANNEX 3 – SAP STRATEGIC AREAS & ACTIONS FOR THE GOM LME

Action lines and priority actions identified by strategic area and indicators of environmental quality. The leading organization in Mexico is listed for each course of action. The main organization of the U.S. is NOAA is in all cases, with the support of other agencies, such as the U.S. EPA

ENVIRONMENTAL QUALITY STRATEGIC AREAS

I. Improve Water Quality	II. Avoiding depletion and recover degraded living marine resources	III. Conserve Coastal and Marine Ecosystems.	IV. Mitigate and Adapt to Climate Change and Sea Level Rise.	V. Improve Science Education and outreach.

ACTIONS LINES

I. Improve Water Quality	II. Avoiding depletion and recover degraded living marine resources	III. Conserve Coastal and Marine Ecosystems.	IV. Mitigate and Adapt to Climate Change and Sea Level Rise.	V. Improve Science Education and outreach.
A. Reduce Pollution.	A. Identify priority areas for maintenance of biodiversity.	A. Promote restoration of natural processes in the watersheds	A. Document potential impacts from climate change on the GoM LME.	B. Communicate and disseminate the goals and results of the LME program.
B. Improve Management Practices.	B. Promote Sustainable Fisheries.	B. Protect Marine and Coastal Connectivity.	B. Support community adaptation to climate change and sea level rise.	
	C. Utilize traditional ecological knowledge.	C. Promote Community-Based Conservation Programs.		
		D. Reduce impacts of invasive species.		
		E. Promote community resilience sustainable livelihoods.		

Actions lines and priority actions to achieve environmental quality Strategic Area I:

Improve Water Quality - The conditions of coastal waters in the GoM LME are a reflection of the changes in the natural hydrology and pollution from urban development, industry, agricultural runoff, atmospheric deposition and other sources across the Gulf basin. The SAP will support these efforts through understanding and addressing the improve management practices and reduce pollution.		
Target:	**Indicator:**	**Lead organization (s) MEX / U.S.**
Increase wastewater treatment	Wastewater treated/total of wastewater (other indicators: number of wastewater discharges; number of wastewater treatment plants; DBO5; SST; reduction of nutrients from the watersheds; decrease of agrochemicals)	CONAGUA / NOAA-EPA
Formulate or implement four legal, policy or planning instruments related to reduce water pollution	Number of legal, policy, planning or monitoring instruments related to water pollution reduction (number of sites monitored; flow that meets ecological objectives; surface and underground water availability calculations; waste management; water reserves) Number of formulated or implemented instruments/ programmed mean planned instruments	CONAGUA / NOAA-EPA

I.A Action line: Reduce pollution	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Promote best management practices for use of pesticides and fertilizers in agricultural activities to reduce inputs of nutrients and agrochemicals to coastal waters.	SAGARPA / NOAA-EPA
2. Promote sustainable practices in the design and operations of sewage and waste management and treatment	CONAGUA / NOAA-EPA

systems.	
3. Prevent, identify, monitor and promote the mitigation of environmental impacts resulting from urban and industrial pollutants.	PROFEPA / NOAA-EPA
4. Expand existing and develop new partnerships to raise awareness of the extent of pollution impacts, including marine debris, on the health and productivity of the marine environment and implications for economic loss.	/ NOAA-EPA
5. Promote expansion and integration of a regional monitoring and information gathering system for harmful algal blooms.	COFREPRIS, CONABIO / NOAA-EPA
6. Promote the development of indicators of water quality in the region, especially in coastal areas, to assess their status and evolution.	CONAGUA / NOAA-EPA
7. Promote the establishment of quality goals in the medium and long term.	CONAGUA / NOAA-EPA

I.B Action line: Improve Management Practices.	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Promote integrated watershed management, cumulative impact evaluations, and environmentally sound waste management.	CONAGUA / NOAA-EPA
2. Promote sustainable practices related to oil and gas exploration and development.	SE / NOAA-EPA
3. Cooperate to implement joint prevention and cleanup programs of marine debris.	SEMARNAT / NOAA-EPA
4. Develop and implement nutrient reduction plans and best management practices for river discharges into the Gulf.	/ NOAA-EPA
5. Promote study, conservation, and reuse of sediments (e.g. wetland creation from dredged sediments).	/ NOAA-EPA

Actions lines and priority actions to achieve environmental quality Strategic Area II:

Avoiding depletion and recover degraded living marine resources - More than 300 species sustain local fisheries in the GoM LME (including fishes, crustaceans, mollusks, echinoderms and other invertebrates). However, many stocks in the Gulf of Mexico are over-fished, or are at or near their maximum yield. Depletion of fish stocks affects both countries due to the fact that many stocks are transboundary, migratory, or connected via egg or larval transport.		
Target:	**Indicator:**	**Lead organization (s) MEX / U.S.**
Manage fishing effort	Number of fishing vessels decreased or maintained at sustainable levels (other indicators: percentage of stocks subject to overfishing; percentage of by-catch of target and non-target species).	CONAPESCA / NOAA-EPA
Formulate or implement seven legal, policy or planning instruments related to fish or aquaculture management	Number of legal, policy or planning instruments related to fish or aquaculture management (aquaculture and fisheries management programs; update of the national fisheries chart; restoration programs, implementation of the model resulted from the first phase of the LME project*) Number of formulated or implemented instruments/ programmed mean planned instruments.	CONAPESCA, INAPESCA / NOAA-EPA

II.A Action line: Identify Priority Areas for Maintenance of Biodiversity	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Establish area-based measures, such as marine protected areas and networks and fishery refuges, and integrate them through ecosystem based management at the Gulf-wide level.	SEMARNAT (CONANP) - SAGARPA (INP) / NOAA-

	EPA

II.B Action line: Promote Sustainable Fisheries.	
PRIORITY ACTIONS	**Lead organization (s)**
1. Work cooperatively to recover depleted transboundary fishery stocks and other living marine resources.	SAGARPA (INP) / NOAA-EPA
2. Improve habitats and environmental conditions that support fishery production.	SEMARNAT / NOAA-EPA
3. Cooperate in information exchange and stock assessments.	SAGARPA (CONAPESCA) / NOAA-EPA
4. Honor the FAO Code of Conduct for Responsible Fisheries and associated FAO International Plans of Actions (IPOAs), endorsed by Mexico and the U.S.	SAGARPA (CONAPESCA) / NOAA-EPA
5. Increase the capacity of management agencies to recover depleted living marine resources.	SAGARPA (CONAPESCA) SEMARNAT (CONANP) / NOAA-EPA
6. Evaluate the performance and effects of fishing subsidies promoting sustainability and avoiding over-capacity and over-fishing.	SAGARPA (CONAPESCA) SEMARNAT (CONANP) / NOAA-EPA
7. To the extent permitted by applicable U.S. and Mexican domestic laws, exchange information and conduct	SAGARPA

cooperative research to better understand how estuarine habitats and inshore environmental conditions are linked to fishery production.	(CONAPESCA) / NOAA-EPA
8. Identify factors and share experiences on best practices to help sustain fishery production.	SAGARPA (CONAPESCA) SEMARNAT (CONANP) / NOAA-EPA
9. Promote bilateral cooperation for adaptation of fisheries and fisheries management to climate change based on information, maps and models of its potential effects on marine productivity and ecosystems.	SAGARPA (CONAPESCA) / NOAA-EPA

II.C Action line: Utilize traditional ecological knowledge.	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Improve understanding and acceptance of local traditions related to resource used and management.	SAGARPA (CONAPESCA) SEMARNAT (CONANP) / NOAA-EPA
2. Facilitate the exchange of experiences and practices between resource users from both countries.	SAGARPA (CONAPESCA) SEMARNAT (CONANP) / NOAA-EPA

Actions lines and priority actions to achieve environmental quality Strategic Area III:

Conserve Coastal and Marine Ecosystems – Trends of increasing urban growth are occurring at the expense of sand

dunes, estuaries, marshes, sea grasses, coral reefs, mangroves and other critical habitats		
Target:	**Indicator:**	**Lead organization (s) MEX / U.S.**
Restore 3,000 ha of wetland	Wetlands surface restored Number of hectares restored/ Number of hectares planned	CONAFOR / NOAA-EPA
Formulate or implement five legal, policy or planning instruments related to coastal and marine ecosystems conservation	Number of legal, policy or planning instruments related to coastal and marine ecosystems conservation (national protected areas, RAMSAR sites; twining programs; land and sea use plans; wild life management programs; biodiversity strategies; red tides actions; implementation of the recommendations resulted from the LME project*) Number of formulated or implemented instruments / programmed mean planned instruments	· CONANP · CONAFOR · CONABIO · SEMARNAT(DGPAIRS, DGVS) / NOAA-EPA
Identify and reduce impacts of invasive species.	Public regional invasive species database. Invasive species control program or specific actions at key sites	· CONABIO · SEMARNAT · SCT · / NOAA-EPA

III.A Action line: Promote restoration of natural processes in the watersheds	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Support community-based habitat restoration projects and initiatives.	SEMARNAT (CONANP) / NOAA-EPA
2. Promote efforts to address erosion, such as living shorelines, expansion and conservation of forest cover and the use of conservation tillage in basins that discharge into the Gulf of Mexico.	SEMARNAT / NOAA-EPA

3. Restore natural hydrological processes.	/ NOAA-EPA

III.B Action line: Protect Marine and Coastal Connectivity.	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Strengthen the effectiveness of marine protected areas by linking them into networks.	SEMARNAT (CONANP) / NOAA-EPA
2. Reduce habitat loss and fragmentation.	SEMARNAT (CONANP) / NOAA-EPA

III.C Action line: Promote Community-Based Conservation Programs.	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Utilize best management practices.	SEMARNAT (CONANP) / NOAA-EPA
2. Develop effective education and outreach programs.	SEMARNAT (CONANP) / NOAA-EPA
3. Reduce destructive land use practices.	SEMARNAT (CONANP) / NOAA-EPA
4. Promote urban and coastal development projects and related land-reclamation activities, carried out in a responsible manner that protects the marine environment.	SEMARNAT / NOAA-EPA

III.D Action line: Reduce impacts of invasive species.	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Collaborate on development of a public regional invasive species database that includes information on potential risks and threats associated with each species.	SEMARNAT (CONABIO) / NOAA-EPA
2. Establish a joint invasive species control program at key sites or during life stages where control can have a measurable benefit on the ecosystem.	SEMARNAT (CONABIO) / NOAA-EPA
3. Develop and implement an education plan (including a best practices manual) to raise the awareness of the threats posed by invasive alien species.	SEMARNAT (CONABIO) / NOAA-EPA
4. Increase the understanding of pathways of invasive species colonization, including climate change scenarios and collaborate on promoting improvements to the effective management of those pathways.	SEMARNAT (CONABIO) / NOAA-EPA

III.E Action line: Promote community resilience sustainable livelihoods.	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Contribute to protect human life, public and private property.	SEMARNAT (INECC) / NOAA-EPA
2. Promote "smart growth" development.	SEMARNAT (INECC) / NOAA-EPA
3. Promote awareness of cultural values and traditional livelihoods.	SEMARNAT (INECC) / NOAA-EPA

Actions lines and priority actions to achieve environmental quality Strategic Area IV:

Mitigate and Adapt to Climate Change and Sea Level Rise – The GoM LME will continue to be impacted by climate change and its associated effects such as variation in ocean temperature, sea level rise, ocean acidification, and changes in storm and rainfall patterns. Therefore, the design and implementation of common policies and strategies that incorporate the anticipated effects of climate change will be a critical component of efforts to strengthen the resiliency of coastal communities.		
Target:	**Indicator:**	**Lead organization (s) MEX / U.S.**
Decrease vulnerability and risk associated to climate change	**Mx** is still evaluating the quantification of this target (other indicators: %of areas, population, ecosystems)	· SEMARNAT(DGPCC) · INECC(CPCC) / NOAA-EPA
Formulate or implement five legal, policy or planning instruments related to climate change	Number of legal, policy or planning instruments related to climate change (Climate Change State Action Programs; Climate Change Special Program; national and municipal atlas) Number of formulated or implemented instruments	· SEMARNAT(DGPCC) · INEC(CPCC) · SEGOB(CENAPRED) · SEDATU / NOAA-EPA

IV.A Action line: Document potential impacts from climate change on the GoM LME	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Develop and, to the extent permitted by the Parties' applicable laws, exchange information, maps, and models of the potential impacts from climate change (sea level rise, ocean acidification, storms, floods, etc) on GoM living marine resources and ecosystems and coastal communities, including carrying capacity and community resilience.	· SEMARNAT (INECC) / NOAA-EPA
2. Promote understanding of the causes of and impacts from climate change (i.e., sea level rise, ocean acidification, changing storm frequency/magnitude/extent/duration changing precipitation patterns) and develop common transboundary strategies to jointly confront its effects.	· SEMARNAT (INECC) / NOAA-EPA

3. Support efforts to improve coastal near shore and terrestrial mapping and modeling to develop a better understanding of sea level rise, flooding, and climate change impacts.	· SEMARNAT (INECC) / NOAA-EPA
4. Support scientific collaboration to better understand potential land use and coastal ecosystem changes associated with climate changes and sea level rise.	· SEMARNAT (INECC) / NOAA-EPA

IV.B Action line: Support community adaptation to climate change and sea level rise.	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Promote actions to assess, adapt to and reduce vulnerability to sea level rise.	· SEMARNAT (INECC) / NOAA-EPA
2. Enhance early warning systems that allow coastal communities more time to react to potential disasters.	· SEMARNAT (INECC) / NOAA-EPA
3. Promote, exchange and disseminate integral risk management practices, approaches and models, to the extent permitted by applicable U.S. and Mexican domestic laws.	· SEMARNAT (INECC) / NOAA-EPA
4. Generate coordinated disaster response plans among various levels of government and among various stakeholders	· SEMARNAT (INECC) / NOAA-EPA

Action lines and priority actions to achieve environmental quality Strategic Area V:

Improve Science Education and Outreach - Public participation and greater understanding of the social, cultural and scientific elements of the GoM LME will enhance regional cooperation and partnership.		
Target:	**Indicator:**	**Lead organization (s) MEX / U.S.**
Consolidate the Environmental Educators Alliance and the Consortium of Research Institutions of the Gulf of Mexico as independent entities.	A consolidated Environmental Educators Alliance.	GoM LME Project / NOAA-EPA
Create or implement 5 national and/or binational environmental education regional programs.	A Consolidated Consortium of Research Institutions of the Gulf of Mexico Number of created or implemented national and/or binational regional programs / Number of programmed programs.	GoM LME Project / NOAA-EPA
Increase understanding and use of climate, ocean and	Number of workshops, conferences (other indicators: use of the results of the LME project in decision making; number of graduates in marine disciplines;	· GoM LME Project · SEMARNAT(CECADESU)

coastal environmental information.	capacity building) Number of held workshops and conferences / Number of programmed workshops.	· SEP · SEMAR / NOAA-EPA

V.A Action line: Communicate and disseminate the goals and results of the LME program.	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Identify target audiences.	SEMARNAT (CECADESU) / NOAA-EPA
2. Expand classroom and field-based education through both formal and informal methods.	SEMARNAT (CECADESU) / NOAA-EPA
3. Promote education and training of students at all levels in ecosystem science and ecosystem-based management to increase capacity in fields that support the goals and objectives of the SAP. Encourage university exchanges between institutes in the US and Mexico.	SEMARNAT (CECADESU) / NOAA-EPA
4. Improve access to scientific knowledge by resource managers and decision makers.	SEMARNAT (CECADESU) / NOAA-EPA

Cross-cutting strategic areas are described taking into account the high connectivity between environmental issues in the GoM LME and the need for an EBM approach.

VI.I. Promote compliance with existing institutional, policy and legal arrangements	VI.II. Promote integrated management processes for the implementation of the actions.	VI.III. Create monitoring and evaluation indicators pursuant to GEF guidelines to measure success and progress to reach goals.	VI.IV. Enhance information and knowledge exchange and promote awareness and participation.	VI.V. Incorporate sustainability, new technology and innovative economic instruments.	VI.VI. Consider and adapt to predicted climate change impacts.
			ACTIONS LINES		
A. Strengthen institutional cooperation for regional planning	A. Utilize Ecosystem Based Management.	A. Monitor ecosystem responses to programmatic action.	A. Promote the use of sound science to better inform management decisions	A. Improve efficiency of existing monitoring programs by applying new technologies.	A. Promote adaptation actions.
		B. Conduct programmatic reviews.		B. Incorporate economic instruments and exchange of experiences.	

Actions lines and priority actions to achieve Strengthen institutional Strategic Area VI (Cross-Cutting Issues)

VI.I. **Promote compliance with existing institutional, policy and legal arrangements**. Enhanced cooperation among institutions is necessary for a better understanding of policy issues and laws at the regional level.		
Target:	**Indicator:**	**Lead organization (s) MEX / U.S.**
Improve inspection and surveillance actions	Number of inspection and surveillance actions by federal, state and municipal authorities (an additional indicator is the number of inspections where full compliance or a percentage of compliance was found)	PROFEPA CONAGUA SCT SEMAR Enforcement State authorities Municipal inspection authorities / NOAA-EPA

VI.I.A Action line: A. Strengthen institutional cooperation for regional planning	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. To the extent permitted by applicable U.S. and domestic laws, share information about ecosystem-based	SEMARNAT / NOAA-EPA

approaches and consider technical issues, data compatibility and evaluation methodology.	
2. Develop a Protected Areas Network and other conservation policy tools and instruments to support efforts for conservation of ecosystems.	SEMARNAT / NOAA-EPA
3. Facilitate inter-agency coordination and identify additional sources of financial support for regional planning.	SEMARNAT / NOAA-EPA

VI.II. **Promote integrated management processes for the implementation of the actions.** Integrated management would seek to enhance strategic partnerships and would facilitate better decision-making processes.		
Target:	**Indicator:**	**Lead organization (s) MEX / U.S.**
Conduct two exchange mechanisms to discuss environmental good and services and environmental impact evaluation practices.	Number of bi-national workshops, conferences and other exchange mechanisms implemented/ Number of bi-national workshops, conferences and other exchange mechanisms programmed*	GoM LME Project / NOAA-EPA

VI.II.A Action line: Utilize Ecosystem Based Management.	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Promote the evolution from single-species, single-habitat, and sectoral approaches to a more integrated ecosystem approach to science and management.	SEMARNAT / NOAA-EPA

2. Determine the value of the existing ecosystem goods and services.	SEMARNAT / NOAA-EPA
3. Identify common environmental quality objectives and goals.	SEMARNAT / NOAA-EPA
4. Participate in Integrated Ecosystem Assessment efforts underway in the GoM by identifying ecosystem services, indicators, and drivers related to productivity of living marine resources.	SEMARNAT / NOAA-EPA
5. Contribute information and assist in the development of GoM ecosystem models such as Ecopath with Ecosim; Atlantis; or others.	SEMARNAT-SAGARPA (INAPESCA) / NOAA-EPA
6.To the extent permitted by applicable U.S. and Mexican domestic laws, exchange experiences on environmental impact assessment practices relating to infrastructure projects in sensitive habitats.	SEMARNAT/ NOAA-EPA

VI.III. Create monitoring and evaluation indicators pursuant to GEF guidelines to measure success and progress to reach goals.

Target:	Indicator:	Lead organization (s) MEX / U.S.
Increase monitoring sites with National Coastal Condition methodology.	Number of additional monitoring sites / Number of programmed monitoring sites.	GoM LME Project / NOAA-EPA
Design and/or implement five monitoring strengthening actions	Number of monitoring strengthening actions (capacity-building, courses, infrastructure –buoys, laboratories; data collection; technical assistance) Number of designed or implemented actions / Number of programmed actions.	· GoM LME Project · INAPESCA · CONABIO · SEP · SEMAR / NOAA-EPA

VI.III.A Action line: Monitor ecosystem responses to programmatic action.	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Conduct a gap analysis by identifying and evaluating existing monitoring efforts.	SEMARNAT/ NOAA-EPA
2. Build upon existing monitoring efforts to meet program needs.	SEMARNAT/ NOAA-EPA
3. Agree on baseline information and a networking system based on related existing initiatives.	SEMARNAT/ NOAA-EPA

VI.III.B Action line: Conduct programmatic reviews.	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Establish and implement protocols for periodic program reviews.	SEMARNAT/ NOAA-EPA

VI.IV. Enhance information and knowledge exchange and promote awareness and participation.		
Target:	**Indicator:**	**Lead organization (s) MEX / U.S.**
Design and/or implement five mechanisms to disseminate information and promote awareness about the LME	Number of mechanisms (Other indicators: number of geoportals; information on the project´s webpage*) Number of designed or implemented mechanisms / Number of programmed mechanisms.	· GoM LME Project · CONABIO · SEP(UABC-CeNDO) / NOAA-EPA

Conduct five studies related to the conservation of coastal and marine natural resources and monitoring of health ecosystems	Number of new studies related to the target Number of studies done / Number of programmed studies	· INECC · CONABIO · SEP / NOAA-EPA

VI.IV.A Action line: Promote the use of sound science to better inform management decisions	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Promote enhanced understanding of oceans processes that contribute to the program goals.	SEMARNAT/ NOAA-EPA

VI.V. Incorporate sustainability, new technology and innovative economic instruments.		
Target:	**Indicator:**	**Lead organization (s) MEX / U.S.**
Promote resources or actions related to green growth and or blue economy used for restoration of coastal ecosystems, pollution reduction and recovery of living marine	Amount of resources and actions implemented/ Amount of resources and actions programmed	· SEMARNAT(DGPAIRS, DGVS) · CONANP / NOAA-EPA

resources		

VI.V.A Action line: Improve efficiency of existing monitoring programs by applying new technologies.		
PRIORITY ACTIONS		**Lead organization (s) MEX / U.S.**
1. Collaborate on evaluating and testing emerging environmentally friendly technologies for monitoring and assessment		SEMARNAT/ NOAA-EPA

VI.V.B Action line: Incorporate economic instruments and exchange of experiences.		
PRIORITY ACTIONS		**Lead organization (s) MEX / U.S.**
1. Promote consultation with leading economists and social scientists and exchange of experiences to evaluate Gulf of Mexico ecosystems and promote coastal habitat and fisheries conservation.		SEMARNAT/ NOAA-EPA
2. Develop and promote the use of economic incentives and instruments to improve ecosystems, fisheries and living marine resources conservation.		SEMARNAT/ NOAA-EPA

VI.VI. Consider and adapt to predicted climate change impacts.		
Target:	**Indicator:**	**Lead organization (s) MEX / U.S.**
Design and/or implement five mechanisms to disseminate	Number of mechanisms (Other indicators: number of geoportals; information on the project´s webpage*)	· GoM LME Project · CONABIO

information and promote awareness about the LME	Number of designed or implemented mechanisms / Number of programmed mechanisms.	SEP(UABC-CeNDO) / NOAA-EPA
Conduct five studies related to the conservation of coastal and marine natural resources and monitoring of health ecosystems	Number of new studies related to the target Number of studies done / Number of programmed studies	· INECC · CONABIO · SEP / NOAA-EPA

VI.VI.A. Promote adaptation actions.	
PRIORITY ACTIONS	**Lead organization (s) MEX / U.S.**
1. Promote conservation of the structure and function of ecosystems that can not only improve the resilience of coastal communities, but also contribute to natural CO_2 sequestration (i.e mangroves, sea grasses). Seek out additional actions that provide mitigative and adaptive co-benefits.	SEMARNAT/ NOAA-EPA
2. Evaluate the impacts of future climate change on each strategic action and build in flexibility so the actions can respond and adapt to potential impacts.	SEMARNAT/ NOAA-EPA

∗   Actions considered in the GoM LME Project next phase