



## Highlights of Action Plan II (DRAFT v2)

### Water Quality for Healthy Beaches and Shellfish Beds

Water is the basis of life everywhere. The condition of this water is one of the many factors influencing the health of human and natural communities in the Gulf of Mexico region. The economies of the five Gulf states are substantially dependent on productive natural resources and ecosystems.

#### Long-term Water Quality Goals....in 20 years

- A real-time pathogen monitoring network that identifies the sources of pathogens in coastal and estuarine waters and their potential impact on human health and the coastal economy
- A Harmful Algal Bloom tracking and forecasting system that supports the reduction or elimination of blooms and that can be used by coastal managers to minimize the human health and negative economic effects from algal blooms
- A reduced risk of mercury-induced health effects from Gulf seafood consumption
- A cooperative and integrated water quality monitoring network for estuarine, coastal, and offshore waters that provides vital information on the status and trends of Gulf ecosystem health

**WQ-1: Pathogens: Ensure healthy beaches and shellfish beds by improving the understanding of waterborne disease-causing microorganisms (“pathogens”), including their sources and survival so that coastal managers can make informed decisions that benefit public health and coastal economies.**

#### Why do this?

A better understanding of pathogens and their sources will allow agencies to reduce the risk of human illnesses due to exposure to Gulf coastal waters. Enhanced awareness of environmental and ecological factors affecting *Vibrio* populations will decrease the number of *Vibrio*-related deaths and illnesses in coastal communities. By establishing a pathogen monitoring network and populating it with real-time data, local resource managers can address health management issues in a pro-active, rather than reactive, way. In turn, best management practices can be employed to focus resources using risk-based approaches.

### **Results at the end of 5 years**

- New methods are available to assess the source (human or otherwise) of pathogens or their indicators and to better determine public health risk.
- The survivability of pathogens and current indicator organisms in ambient waters has been assessed.
- One pollution source-tracking pilot study has been conducted in each state at a beach with bacterial-contamination problems.
- Risk-based models have been developed that incorporate seasonal and geographic distributions to predict hazardous increases in pathogen concentrations.
- A data portal or website is available that provides access to comparable water quality data from beach monitoring programs in all Gulf States.
- Areas of high risk for unsafe microbial concentrations have been identified and areas mapped that are listed by EPA as impaired from microbial contamination.
- Information on the distribution and ecology of *Vibrio* species is available to better assess risk to human health.
- Pathogen detection and microbial source tracking workshops have been conducted to provide guidance for research.

### **WQ-2: Harmful Algal Blooms: Reduce the effects of HABs by improving the ability to detect, track, and forecast HAB movement and effects in waters along the Gulf Coast.**

#### **Why do this?**

Once the ecology of HABs is understood, an early warning and forecasting system can be developed using real-time data. However, present technologies for detecting and tracking HABs are expensive and generally not suitable for long-term deployment. To be effective existing monitoring networks need to be compatible and regional in coverage in order to detect, track, and forecast blooms that migrate across the Gulf. Management strategies can then be developed to improve responses to bloom events and to reduce the frequency of blooms and the extent of their impacts on coastal recreation and ecosystems health.

### **Results at the end of 5 years**

- Human health impacts from HABs are better understood.
- HAB detection methods and technologies have been evaluated and standardized.
- Researchers and managers have access to standardized protocols and an understanding of how to use new HAB technologies.
- An operational, web-based discussion board for public communications and managerial decisions is in place.
- Training is provided to help coastal managers use their resources efficiently to minimize bloom effects.
- Tools are available for state epidemiology units to assess HAB effects.

- Methods are available that help prevent, control, or mitigate HABs.
- The significance is better understood of ballast-water introductions and transfers of both new and existing HAB species in the Gulf of Mexico.

**WQ-3: Mercury in Seafood: Identify sources of mercury in Gulf fishery resources, understand its presence in the Gulf of Mexico food web, and develop the ability to reduce the human health risk of exposure.**

**Why do this?**

Mercury in seafood can have significant human-health and economic effects; the scope of which is not clearly understood. Removing mercury from seafood cannot be addressed without first understanding the sources, fate, and transport of it around the Gulf as well as understanding the scope of its effects on human health and the economy.

**Results at the end of 5 years**

- The primary sources that are responsible for mercury in Gulf of Mexico fish are identified and communicated to public health advisory groups.
- The mechanism by which mercury enters the food chain and accumulates in Gulf of Mexico fish is better understood.

**WQ-4: Monitoring: Obtain and provide vital information about the conditions of Gulf of Mexico waters to support management decisions regarding coastal fisheries, recreation, tourism, public health, and infrastructure planning.**

**Why do this?**

A region-wide water quality monitoring network will provide an abundance of information to address both local and Gulf-wide issues, such as land-use decisions, water quality criteria, nutrient loading, mercury source tracking, etc. With a searchable catalog of monitoring program information available, an increased number of potential users will know where to access Gulf region water quality data, allowing issues to be addressed more efficiently. Agencies being aware of potential additional sources of water quality data should result in more appropriate total maximum daily loads.

**Results at the end of 5 years**

- Water quality data collected around the Gulf is of documented quality. There is also increased comparability between what is being monitored and how it is monitored. Documented quality and increased comparability of data result in greater usability of water quality information Gulf-wide.
- Data gaps are identified and a strategy has been developed for filling them.
- A repository of information about Gulf monitoring programs is available to the public.
- A pilot project that links geographic information system (GIS), land-use, circulation models, and water quality has been conducted.

- New data-dissemination tools are available to help coastal resource managers access and interpret water quality data and models.

## Habitat Conservation & Restoration

The Gulf of Mexico coastal zone has suffered significant degradation and loss of natural habitats, as well as the associated loss of ecological services attendant to those changes. Population growth, changes in land use patterns, and other human impacts in the coastal zones have exacerbated the natural processes underlying these trends. To remain healthy and sustainable, the communities of the Gulf of Mexico must ensure that economic development is consistent with environmental sustainability.

### **Long-Term Habitat Conservation & Restoration Goals...in 20 years**

- An approach to habitat conservation and restoration that includes a diverse group of stakeholders from state, federal, and international agencies, business and industry, and non-profit organizations.
- Improved policies that promote conservation and restoration efforts in both the public and private arena are in place resulting improved habitats in the Gulf region.
- Application of science and technology to provide improved management tools for conservation and restoration.
- An accurate tracking system to document gains and losses of Gulf of Mexico coastal habitats and ecosystem services.

**H-1: Expanded Partnerships: Identify and engage non-participating relevant U.S. stakeholders with interest in the health and sustainability of the Gulf of Mexico, and coordinate specific issues with representatives from the Gulf Mexican states.**

### **Why do this?**

The challenges facing the communities of the Gulf of Mexico region require that people and governments commit to developing and implementing solutions. The process of improving conservation and restoration requires that governments change policies and develop new strategies for reducing habitat losses and restoring those which are degraded. This is the case in both the United States and in the six Mexican states that border the Gulf of Mexico, which contain nearly half the contiguous coastline between the Florida and Yucatán Peninsulas. To fully address the need for conservation and restoration it is imperative that many stakeholders cooperate, including public and private landowners, business and industry leaders, non-profit organizations, and international partners in the United States and Mexico. Cooperation includes external private-public partnerships that provide the incentives to develop and implement new government policies which encourage management of private and public lands to the benefit of present and future societies.

### **Results at the end of 5 years**

- Alliance stakeholders in the United States and Mexico are actively involved in pursuing Gulf habitat conservation and restoration through an integrated and robust set of private and public partnerships.

### **H-2: Policy Changes: Address specific bureaucratic issues impeding habitat conservation and restoration.**

#### **Why do this?**

Existing policies and regulations may inadvertently create impediments to the private and public conduct of efficient habitat conservation and restoration. Improved regulatory policies and funding approaches will result in less habitat damage and greater habitat restoration.

### **Results at the end of 5 years**

- Improvements in federal and state funding, permitting, policy, and regulations regarding habitat conservation and restoration.

### **H-3: Technology Development: Identify and resolve specific scientific and technical issues so that conservation and restoration of Gulf habitats is more successful.**

#### **Why do this?**

Future habitat conservation and restoration programs must be based on effective restoration science. A Gulf-wide effort will serve as a platform to promote emerging technologies and science-based management tools.

### **Results at the end of 5 years**

- Priority conservation and restoration science issues and improved science-based management tools are available for on-the-ground projects.

### **H-4: Gulf Regional Sediment Management Master Plan: Develop and implement the Gulf Regional Sediment Management Master Plan (GRSMMP) to more effectively use dredged material and other sediment resources for restoration projects.**

#### **Why do this?**

Sediments, both natural and dredged, can be more effectively use to benefit conservation and restoration efforts than they are now. The GRSMMP provides a regional blueprint for beneficial use of dredged materials. Implementation of the GRSMMP will result in quicker and less costly restoration.

### **Results at the end of 5 years**

- The GRSMMP is complete and regional sediment management is implemented in all U.S. Army Corps of Engineers Districts in partnership with the Gulf States.
- Restoration project costs are greatly decreased by the increased re-use of dredged materials.

### **H-5: Reversing the Downward Trend in Habitat and Ecosystem Services: Monitor a Gulf-wide inventory of distribution, gain and loss of coastal habitats and measure the ecosystem services they provide, in conjunction with other relevant Priority Issue Teams.**

#### **Why do this?**

Conservation and restoration efforts in the Gulf region protecting critical habitats as well as bolstering coastal resiliency, and are therefore, essential to the region's economy as a whole. A robust inventory of Gulf coastal habitat distribution that includes ongoing and future conservation and restoration activities will help stakeholders make strategic management decisions.

### **Results at the end of 5 years**

- Joint efforts of the six Priority Issue Teams illustrate a reversal in the present downward trend in Gulf of Mexico coastal habitat and the ecosystem services that they provide to stakeholders.

## **Environmental Education**

The Gulf of Mexico's influence on climate, health and economic vitality reaches beyond the 31 states and two Canadian provinces that are within its watershed. This influence provides an immense opportunity to create education programs that develop an environmentally literate society. Environmental education includes formal and informal educational opportunities, professional development, communication, and actions which reach a vast array of target audiences who truly reflect the phrase "K to Gray." Cultural and historical nuances enhance the vitality of communities and strengthen the drive to support economic health and ecological welfare. Providing environmental education to a wide range of audiences that includes cultural and economic values will increase actions toward a healthier Gulf.

### **Long-term Environmental Education Goals...in 20 years**

- Environmental literacy concerning resources and issues important to the Gulf of Mexico is enhanced.
- Stewardship of the Gulf of Mexico is increased through measurable, targeted education.

- Intra-Alliance communication and collaboration concerning public education and outreach of Alliance priorities is strengthened.

**ED-1: Community Education and Outreach: Build upon the existing success of Alliance partners to increase awareness and promote action among Gulf citizens by engaging through outreach activities.**

**Why do this?**

Education experts have learned that being aware and informed does not always translate into action. Engaging local audiences on issues that directly affect them will strengthen the foundation for behavioral changes, thereby positively affecting Gulf-wide environmental stewardship. This increased participation will be a strong vehicle for improving the health of the Gulf as well as the economy of the nation as a whole.

**Results at the end of 5 years**

- Expanded partnerships with organizations undertaking outreach activities across the Gulf are identified and strengthened.
- On-the-ground outreach and education projects that engage the public are developed and implemented.
- Increased access to volunteer/service-learning opportunities through organizations such as Coastal Ecosystem Learning Centers.

**ED-2: Public Awareness: Expand public awareness efforts to connect the Gulf of Mexico and its relevance in the lives of citizens.**

**Why do this?**

Streamlining outreach in the Gulf of Mexico under one brand will provide consistency and recognition to the message delivered to the region and the nation. In turn, consistent and timely messages will promote healthy Gulf initiatives, ultimately resulting sustainable coastal communities.

**Results at the end of 5 years**

- A Gulf-wide branding initiative is widely recognized by Gulf residents and visitors.
- Regional messages for all Alliance priority issues have been developed and disseminated to reach regional as well as upstream audiences.
- Opportunities for active participation in healthy Gulf initiatives are available in coastal as well as upstream areas.
- Messages are disseminated through multiple media to include current or alternative technology and informal education centers (museums, aquariums, libraries, and science centers).

**ED-3: K-20 Environmental Literacy: Increase environmental literacy within the K-20 audience by developing, implementing, expanding, and enhancing specific environmental education programs.**

**Why do this?**

By providing experiential learning opportunities across the region, educators and students alike will benefit. Increased knowledge in science education should reflect

increased numbers of individuals pursuing science, technology, engineering, and math as future careers; thus adding to the strength of our regional workforce development. All programs must use evaluation and assessment techniques so that success can be measured in the short and long term.

#### **Results at the end of 5 years**

- Experiential learning opportunities are expanded across all grade levels.
- Programs and field experiences are aligned with state standards and environmental literacy principles.
- Programs targeted toward underrepresented and underserved populations are expanded.
- Professional development and training opportunities utilizing best available technology are increased.

#### **ED-4: Economic Value Communication: Include the economic value of Gulf coast ecosystems in environmental education.**

##### **Why do this?**

Economics – the costs and potential benefits of our personal (or commercial) actions - drives the workforce and the business community. By understanding how conservation and environmental stewardship affect the Gulf coastal economy, the Alliance can promote regional efforts and draw the link to national economic vitality. With this shared understanding, policy-makers will be more knowledgeable concerning the value in promoting and supporting environmental education.

#### **Results at the end of 5 years**

- The economic value of the Gulf of Mexico and its ecosystems are incorporated into local, regional and national environmental education and public awareness initiatives.
- A Teacher's Guide for economic benefits of the Gulf of Mexico is available and formatted for ease of use for various audiences.
- The online digital library includes Gulf of Mexico economic value resources and their availability has been shared.

### **Ecosystem Integration & Assessment**

Coastal ecosystems in the Gulf of Mexico are essential to sustaining local economies and offer protection from coastal storms. Natural disasters such as coastal storms cause significant, measurable economic losses in the infrastructure that supports coastal communities; however, economic losses of natural resources are just as significant and far more difficult to assess. Coastal managers are faced with a complex environment in which to make difficult decisions regarding protection, restoration, conservation and management of these crucial resources.

### **Long-term Water Ecosystem Integration & Assessment Goals....in 20 years**

- A regional data system containing environmental and economic data for all priority issues of concern within the Gulf of Mexico region
- Strategic partnerships to fill environmental and ecological data gaps
- Ecosystem decision support tools for use by coastal resource managers to address all priority issues within the Gulf of Mexico

### **EIA-1: Gulf of Mexico Mapping Master Plan (GMMMP): Produce a comprehensive plan to collaboratively acquire data on the physical characteristics of the Gulf region, particularly elevation, shoreline, and surface data.**

#### **Why do this?**

The Gulf is too large for any one agency to map, thus a collaborative approach is required; one that identifies and fulfills all mapping requirements with on-going mapping programs. Therefore, by aligning data collection methods and sharing resources, critical mapping information can be collected at less cost to the partner programs.

#### **Results at the end of 5 years**

- A Gulf of Mexico Mapping Plan has been developed using shared resources.
- Updated elevation, shoreline and surface characterization data are supporting more effective coastal management decisions across the Gulf.

### **EIA-2: Data Access and Acquisition: Provide resource managers and Alliance partners access to a Gulf-wide data and ecosystem support services system.**

#### **Why do this?**

Improving awareness of and access to available data will aid in the assessment and management of coastal resources. With a thorough knowledge of the status and health of these resources, planners can better anticipate management needs and account for those needs in future planning scenarios.

#### **Results at the end of 5 years**

- Physical, chemical and environmental data are readily available for use by resource managers.
- PHINS is being used to prioritize areas of critical habitat for conservation and/or protection.

### **EIA-3: Living Marine Resources: Provide collaboration opportunities with the various established living marine resource organizations to support the management of the GOM as a large marine ecosystem.**

### **Why do this?**

There are numerous public and non-governmental entities managing components of living marine resources in the Gulf, and these entities share common management challenges and data needs. The Alliance partnership is in a unique position to collaborate with these groups to better coordinate the management of the Gulf as a true large marine ecosystem.

### **Results at the end of 5 years**

- Collaborative partnerships are expanded to better manage living marine resources.
- Agreements between resource managers are in place to address data gaps and support ecosystem-based management efforts.

### **EIA-4: Emergent Wetlands Status and Trends Report : Develop an Emergent Wetlands Status and Trends Report to provide scientists and decision-makers with regional information to guide management decisions.**

### **Why do this?**

Because fifty percent of the nation's wetlands are located in the Gulf, they are critical to the nation's productivity and economic sustainability. In addition, Gulf wetlands serve as protective barriers during storm events. However, emergent wetlands around the coastal fringe of the Gulf of Mexico have seen a significant decline over the past several decades. A status and trends report for these wetland resources will support scientifically-sound recommendations for conservation and restoration.

### **Results at the end of 5 years**

- A status and trends report for emergent wetlands in the Gulf of Mexico is created and is updated at regular intervals.
- Emergent wetlands in the GOM region are better managed.

### **EIA-4: Emergent Wetlands Status and Trends Report : Ecological Services Valuation: Determine socioeconomic values of critical coastal ecosystem services in the Gulf region.**

### **Why do this?**

The true value of ecosystem services are often not considered in coastal management decisions because the socioeconomic values of those services are unknown. Since a sustainable economy and high quality of life are dependent on healthy coastal ecosystems, a better understanding of socioeconomic value of natural systems can lead to better societal decisions.

### **Results at the end of 5 years**

- The economic values of select Gulf of Mexico natural resources are inventoried and documented.
- Coastal resource management decisions are improved by considering the economic values of ecosystem services.

## **Reducing Nutrient Impacts**

All living things depend on nutrients for survival. Nutrients are carried into estuaries and coastal waters through rain, groundwater, rivers, streams, waves and tides. A balance of the right amounts and forms of nutrients is essential to maintaining healthy and productive Gulf ecosystems. Excess nutrients in our water bodies, however, can be detrimental to coastal ecosystems and can cause a decrease in the levels of oxygen available in the water. This condition is called hypoxia and it impacts fish and other aquatic organisms that depend on oxygen for survival and healthy life cycles. Some sources of excess nutrients are man-made and include polluted run-off from urban and agricultural sources, failing septic systems, and atmospheric deposition (nutrients deposited from the air).

### **Long-term Reducing Nutrient Impacts Goals....in 20 years**

- A regional process is created and implemented for the development of comparable nutrient criteria across coastal and estuarine waters.
- Strategies that reduce nutrient inputs and hypoxia are developed and implemented.
- Develop a comprehensive, ecosystem approach to manage nutrient inputs and reduce impacts to coastal ecosystems in the Gulf of Mexico region.
- Increase the capacity of Gulf coastal communities to manage and reduce nutrient impacts.

**N-1: Nutrient Characterization: Implement regional nutrient characterization studies to evaluate ecosystem responses, and develop the tools for better characterization of nutrients in coastal waters.**

### **Why do this?**

Before nutrients can be effectively managed, their roles and impacts within our Gulf ecosystems must be understood. In addition nutrient characterization studies are necessary to improve the science used by water quality managers to address excess nutrients in coastal waters. Nutrient characterization studies will provide a better understanding of the sources and dynamics of nutrients and help establish the links between nutrients and the health of our coastal ecosystems. Leveraging resources and expertise to adequately characterize nutrients in coastal ecosystems assures a more consistent, efficient approach across the Gulf.

### **Results at the end of 5 years**

- Nutrient impacts are adequately characterized to establish key ecological relationships, thresholds, and socioeconomic values for state-selected indicators.
- The Gulf States are provided with integrated models to estimate nutrient loads, establish goals, and predict the ecological and socioeconomic impacts of management decisions.
- The Gulf States have adequate science and management tools to better understand how freshwater and wetland systems influence nutrient impacts.

### **N-2: Nutrient Criteria Development: Identify common state needs and priorities for the development of nutrient criteria and provide support and technical assistance to facilitate a regional approach to nutrient criteria development and management.**

#### **Why do this?**

By working collaboratively, the Alliance is providing a forum to the States that encourages the establishment of consistent and scientifically-defensible coastal nutrient criteria development process. The establishment of appropriate and protective nutrient criteria will, in turn, increase the productivity and economic viability of the Gulf of Mexico.

### **Results at the end of 5 years**

- All five Gulf States have coordinated coastal nutrient criteria development milestones in their respective state Nutrient Criteria Development Plans.
- Through a collaborative effort, the five Gulf States have a consistent, established framework for the development of appropriate and protective coastal nutrient criteria across the Gulf of Mexico.
- Regional forums are established for communication and resource sharing to address nutrient pollution to coastal ecosystems.

### **N-3: Hypoxia: Coordinate strategies and provide guidance to better characterize hypoxia and the resulting socioeconomic impacts.**

#### **Why do this?**

More than 40% of the United States drains into the Gulf of Mexico, therefore, addressing hypoxia in the Gulf requires collaboration and effort at a national scale. On a watershed scale, it is important to encourage the development of watershed-specific nutrient reduction targets to minimize areas affected by hypoxia. The Alliance is and will continue to partner with the Mississippi River Watershed Nutrient Task Force to address the large hypoxic zone off the Louisiana and Texas coasts.

### **Results at the end of 5 years**

- The Gulf states have integrated, regionally-comparable models that predict hypoxia and its impacts.

- Watershed nutrient reduction plans are completed and include strategies for reducing Gulf hypoxia in state-selected priority watersheds.
- Alliance partners have developed nutrient reduction plans for at least five project areas.
- The Alliance and the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force have formed a partnership to implement nutrient reduction and monitoring strategies within the Mississippi River Watershed.

**N-4: Nutrient Reduction Activities: Develop management tools and implement nutrient reduction activities in cooperation with local communities to reduce excess nutrient inputs to estuaries and coastal waters.**

**Why do this?**

Excess nutrients impact ecosystem health and reduce the economic benefit and human use for coastal communities along the Gulf of Mexico. With the Gulf States working collaboratively to characterize nutrients and their impacts, establish coastal nutrient criteria and the increased public awareness of Gulf of Mexico hypoxia, this is a perfect opportunity to implement actions to reduce excessive nutrient inputs to Gulf waters.

**Results at the end of 5 years**

- Local governments and coastal communities have an increased awareness of the ecological and socioeconomic impacts of nutrient pollution and prevention.
- Gulf States and partners have access to information documenting nutrient reduction progress.
- Gulf States and partners have a nutrient reduction strategy template that can be applied to Gulf of Mexico watersheds.
- Additional partnerships are established with upstream states.

**Coastal Community Resilience**

The coast of the Gulf of Mexico has attracted and supported human settlement for over 12,000 years. From the beginning, these settlements have faced and adapted to challenges of living along the coast. Economics and aesthetics drove the growth of coastal populations and fostered the persistence and resettlement of these communities after fire, war, famine, disease and storms. The economic, ecological, and social losses from coastal hazards events have multiplied as development and population growth increasingly place people in harm's way and as the ecosystems' natural resilience is compromised by development and pollution. These growth pressures continue to shape and grow the Gulf of Mexico coast today. In addition, the latest climate change research suggests that new challenges are on the horizon from sea level rise and other impacts.

### **Long-term Coastal Community Resilience Goals....in 20 years**

- More resilient coastal communities and ecosystems in both structure and function
- Regional and localized models of risk and consequences to natural, built, and social environments
- Residents and visitors that understand the risks and consequences associated with living, working, and doing business in the Gulf of Mexico region
- State-of-the-art mitigation methods for reducing risks and enhancing resilience
- Increasing numbers of communities, businesses, and individuals that have adopted new methods for risk mitigation and resilience

**R-1: Risk and Resilience Assessment: Measure the natural, built, and social environments and understand the regional and localized risks and consequences associated with living, working, and doing business along the Gulf of Mexico, including a consideration of climate change.**

#### **Why do this?**

In order to empower coastal communities to become more resilient to coastal hazards, it is important to establish baseline conditions associated with risks and consequences to the natural, built and social environments. Once baseline conditions are established, coastal communities can identify current resilience factors and begin to address gaps in their resilience that pose significant risks or for which unacceptable consequences are inevitable.

#### **Results at the end of 5 years**

- The Resilience Index evaluates 20 coastal communities to self-assess their vulnerabilities and track progress towards greater resilience. 10 of those coastal communities have now adopted more sustainable development policies and procedures.
- Through the installation and monitoring of 10 new CORS and SET's a region-wide geospatial infrastructure is in place and baseline data for monitoring local sea level rise trends in natural and built environments have been established.
- A Resilience Social Climate Survey has been completed in 20 coastal communities that measure trends in public knowledge and acceptance of resilience, coastal hazard, and other related issues.
- Improved accuracy of wetlands dynamics models have been run for estuarine systems around the Gulf to show the ecological impacts of sea level rise. These models were used by 50% of land use planners and zoning ordinances on proper placement of developing areas located within coastal communities.
- Assessment of Gulf-wide risks and resilience of natural, built, and social environments is complete. These assessments have assisted state and local policy makers and land use planners in purchasing parcels of land to prevent development and communities located in hazardous areas from storms.

**R-2: Risk and Resilience Management Toolbox: Inventory existing capabilities and tools to address coastal hazards in the Gulf Region, identify important gaps, and, where needed, develop new methods to enhance regional and local resilience.**

**Why do this?**

Often communities are unaware of the resources available to better manage risks and consequences and improve resiliency. State-of-the-art methods can be shared with communities via workshops, guidebooks, and the clearinghouse (see Priority #3) and will include tools such as models, policy recommendations, and inventory programs for first responders. These methods can support decision-makers at the community level in their efforts to improve resiliency, thus helping to strengthen economies by improving the quality of life for residents and providing stable business environments.

**Results at the end of 5 years**

- Risk and resilience-related management toolbox lead to better informed decision-making and is being used by 50% individuals, businesses, and communities.
- Hazardous materials inventories are accessible to 70% of local and State decision-makers across the Gulf States.
- Recommendations for enhancements to existing resilience policies are implemented in at least 40% of local coastal communities.
- Tragedy Averted: Resilience Management Toolbox saves lives and Ecosystems
- Through the distribution of the Resilience Management Toolbox 70% of coastal marinas have adopted more resilient and environmentally responsible operations and volunteered to become certified as Clean/Sustainable Marinas.

**R-3: Risk and Resilience Communication: Inform and educate stakeholders about the risks and consequences associated with living, working, and doing business in the Gulf of Mexico region as well as any state-of-the-art methods for mitigation and increasing resilience.**

**Why do this?**

Once the risks and potential consequences of coastal hazards are identified and the steps toward becoming more resilient are determined; it is imperative to communicate these findings to the coastal communities and decision makers. Ensuring that the risk assessment and mitigation tools are communicated and made available to the decision-makers at the local level will empower coastal communities to become more resilient.

**Results at the end of 5 years**

- State-specific resiliency guidebooks/handbooks have been developed and distributed to more than 50% of local coastal communities.

- An online Gulf of Mexico Resilience Clearinghouse/Webportal is established and available to all residents of and visitors to the Gulf of Mexico region as well as other interested parties. It is the number one source for communities preparing for coastal hazards.
- Sea level rise modeling results from the Gulf region are available via the Clearinghouse/Webportal, and the Alliance is exchanging information related to sea level rise and climate change with efforts around the country. Resulting in partnerships with Mexico and other nations bordering the Gulf of Mexico
- 20 Resiliency training workshops have been held across the Gulf of Mexico States.
- Resilience information and tools collected and/or developed by the Alliance are available to all Gulf Coast residents using a variety of communication methods. The mass distribution of printing and publishing 50,000 copies of state specific handbooks/guidebooks regarding steps to prepare coastal communities from hazards.