

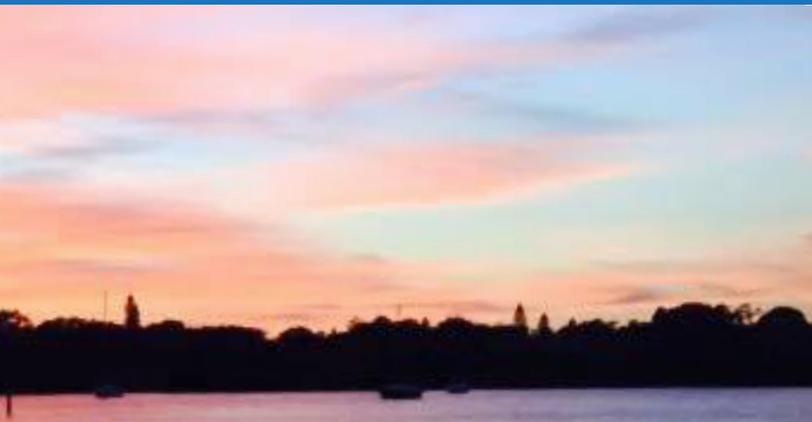


**NOAA  
FISHERIES**

**Southeast Fisheries  
Science Center**

**Highlights of the  
Climate Science Strategy**

# **Gulf of Mexico Regional Action Plan**



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## The Need for Action

The U.S. Gulf of Mexico marine ecosystem, extending from Texas to the Florida Keys, supports a diverse array of living marine resources from commercially valuable shrimp and reef fish to protected sea turtles and whales. These resources – fish, shellfish, marine mammals, sea turtles, corals, plants, habitats, and other ecosystem components – are impacted by a range of manmade and natural stressors that will be exacerbated by changing climate and ocean conditions.

Warming oceans, rising seas, and ocean acidification are considered the key climate concerns for the Gulf of Mexico region. These climate drivers are expected to change the distribution and productivity of marine resources. This can create challenges for marine resource-dependent businesses and communities — including losses of fishing opportunities and deterioration of coastal infrastructure. Understanding how climate change and variability will affect fish,

shellfish, and other living marine resources is critical for wise management.

The Gulf of Mexico Regional Action Plan identifies key actions needed over the next five years to better understand, prepare for, and respond to climate-related impacts on the region's valuable marine resources and the many people that depend on them.

## What's at Risk?

Climate-related changes are already impacting the distribution and abundance of marine resources in many regions of the United States, and these impacts are expected to increase with continued changes in our climate and ocean systems.

The Gulf of Mexico has experienced accelerated losses of saltwater wetlands — 95,000 acre decrease from 2004-2009 — more than double the loss of the previous five years. Although storms, land subsidence, and changes in freshwater inflows each play a role, sea level rise is exacerbating the losses. Coastal habitats provide valuable services by also reducing storm damage and erosion. Changes in the spatial extent and water quality of estuarine habitats, along with wetland loss, affect many economically important fish and shellfish,

and can have dramatic consequences for the human communities connected to them.

At the same time, creating new decision-making and management processes that can adapt to these changing environmental conditions need to be considered and tested. Understanding the scientific information required to support robust, science-based decision-making is also needed and will present challenges for limited agency resources.

### The Gulf of Mexico seafood industry and recreational fisheries play an essential role in the U.S. economy.

| Commercial Fisheries* |               |                                      | Recreational Fisheries* |               |  |
|-----------------------|---------------|--------------------------------------|-------------------------|---------------|--|
| Landings              | <b>1.1</b>    | billion pounds of fish and shellfish | Anglers                 | <b>2.9</b>    | million recreational anglers   |
| Landings Revenue      | <b>\$1.0</b>  | billion in landings                  | Trips                   | <b>21</b>     | million fishing trips  |
| Jobs                  | <b>191</b>    | thousand jobs (with imports)         | Jobs                    | <b>120</b>    | thousand jobs  |
| Sales                 | <b>\$24.3</b> | billion (with imports)               | Sales                   | <b>\$11.5</b> | billion in saltwater fishing trip and durable equipment expenditures |

\*Statistics are from Fisheries Economics of the United States, 2014. Data include impacts for Texas, Louisiana, Mississippi, Alabama, and the entire state of Florida; separate impacts are not available for West Florida.

# Gulf of Mexico Regional Action Plan

*The Regional Action Plan identifies key needs and actions over the next five years to implement the NOAA Fisheries Climate Science Strategy in this region. The Strategy identifies seven key information needs to fulfill NOAA Fisheries mandates for fisheries management and protected species conservation in a changing climate.*

**The Regional Action Plan goal is to increase the production, delivery and use of climate-related information to help reduce impacts and increase resilience of the region's living marine resources and resource-dependent communities.**

The Gulf of Mexico Regional Action Plan identifies 62 actions to advance the NOAA Fisheries Climate Science Strategy at current funding and staffing levels, and others that could be accomplished with additional resources. These actions are broadly consistent with activities currently underway at the Southeast Fisheries Science Center and the Southeast Regional Office, but will require greater integration with these offices along with greater collaboration with other NOAA regional experts, such as the Atlantic Oceanographic and Meteorological Laboratory, and other partners throughout the region.

## Recommended Actions by Objective

### Objective 1 - Identify climate-informed reference points

- Collaborate with colleagues across NOAA and with external partners to share ideas and develop climate-informed reference points.

### Objective 2 - Create robust management strategies for a changing climate

- Use management strategy evaluations to identify harvest control rules that remain effective during anticipated climate changes.
- Collaborate with international partners to share management objectives in light of anticipated climate impacts.

### Objective 3 - Incorporate adaptive decision-making processes

- Continue to build capacity to include climate and environmental covariates in stock assessments.
- Develop adaptive decision theory methods to present quantitative advice and the resulting tradeoffs (i.e., different catch levels).

### Objective 4 - Project future conditions

- Complete the building of a high resolution regional model to downscale global model projections of carbon and biogeochemistry parameters along the northern Gulf of Mexico. This will also provide a range of realistic future scenarios and projections for researchers and managers to use for predicting stock behavior.

### Objective 5 - Understand how things are changing and why

- Conduct climate vulnerability assessments for marine species in the Gulf of Mexico and the associated human communities.

### Objective 6 - Track changes and provide early warnings

- Update and expand the Ecosystem Status Report for the Gulf of Mexico, including the human dimensions component. Include information that can be used to track trends in indicators of ecosystem health.
- Identify new and maintain critical baseline data as part of a comprehensive monitoring program.
- Develop a plan with partners to conduct a comprehensive Gulf-wide survey for marine mammals.

### Objective 7 - Build our science infrastructure

- Establish a formal climate science team composed of experts from across NOAA programs to regularly share ideas, build capacity and partnerships, identify training needs, and spearhead the implementation of actions within the regional action plan.
- Identify and prioritize multidisciplinary data needs for a comprehensive monitoring program for climate science in the Gulf of Mexico, beginning with a data gap analysis to assess the adequacy of existing data and surveys to provide climate science information.

**To learn about actions not listed and related information, please visit the Regional Action Plan:** [www.sefsc.noaa.gov/gmrap.html](http://www.sefsc.noaa.gov/gmrap.html)



# Moving Forward

*Implementing this plan will begin to provide the climate-related information needed to better understand, prepare for and respond to climate impacts on marine resources and the people who depend on them.*

## The actions will help:

- Track climate related changes.
- Produce better predictions.
- Identify effective management strategies in the face of changing climate and ocean conditions.

## The plan will help:

- Provide decision makers and communities with the information they need for climate-ready decisions.
- Reduce impacts and increase the resilience of the nation's valuable living marine resources and the communities that depend on them.

**A critical element of this Action Plan is partnerships. The challenges are great, the issues are complex, and resources are limited.**

**By working together, we can reduce the impacts of changing climate and ocean conditions on living marine resources, and increase the resilience of this valuable ecosystem and the many people, businesses and communities that depend on it.**



Photo Credit:  
Captain Troy Frady

## More Information

### Regional Action Plan

[www.st.nmfs.noaa.gov/ecosystems/climate/rap/](http://www.st.nmfs.noaa.gov/ecosystems/climate/rap/)

### NOAA Fisheries Climate Science Strategy

[www.st.nmfs.noaa.gov/ecosystems/climate/national-climate-strategy](http://www.st.nmfs.noaa.gov/ecosystems/climate/national-climate-strategy)

### Southeast Fisheries Science Center

[www.sefsc.noaa.gov](http://www.sefsc.noaa.gov)

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