The GULF OF MEXICO at a GLANCE

GULF OF MEXICO ALLIANCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NOAA
U.S. DEPARTMENT OF COMMERCE

A Tool for the Gulf of Mexico Alliance and the American Public

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Dear Readers,

The Gulf of Mexico region provides the Nation with valuable energy resources, abundant seafood, extraordinary beaches and leisure activities, and a rich cultural heritage. At the same time, residents must prepare for and respond to some of the most devastating weather events in the Nation, including the most costly natural disaster is U.S. history – Hurricane Katrina in 2005. There are also complex ecosystem health and water quality and quantity challenges being addressed in the Gulf of Mexico region.

The Gulf of Mexico Alliance, as a venue for dramatically increased regional collaboration at the state, local, and federal levels, holds great promise to improve the ecological and economic health of the Gulf region. NOAA is proud to be a partner in this collaborative approach where shared scientific strengths are matched with shared management strengths.

One objective of the Gulf of Mexico Alliance is to build public awareness about the linkages between the Gulf region's ecological health, the high quality of residents' everyday lives, and the economic vitality of the region. To this end, *The Gulf of Mexico at a Glance* provides memorable representations of selected social, economic, and environmental attributes of the Gulf of Mexico region. While this report presents only a few key attributes, it is our hope that others will be inspired to develop broader and more in-depth representations that increase public understanding of these linkages.

Sincerely,

Margaret Davidson
Director
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The GULF OF MEXICO at a GLANCE

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TABLE OF CONTENTS

Introduction.....1

Gulf Communities

Population.....4

Housing and Development.....6

Coastal Vulnerability.....8

Gulf Economy

Recreational Fishing.....9

Commercial Fishing.....10

Tourism and Recreation.....12

Oil and Gas Industry.....14

Waterborne Commerce.....16

Gulf Ecology

Celebrating Diversity.....18

Ecoregions and Threats.....20

Hypoxia in the Gulf of Mexico..22

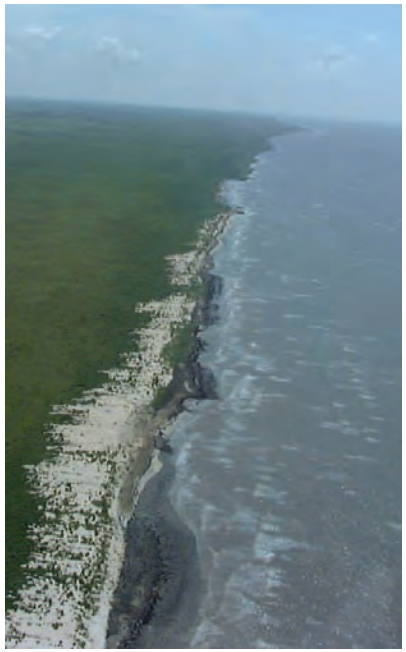
The Gulf of Mexico Alliance is a partnership among the states of Alabama, Florida, Louisiana, Mississippi, and Texas, with the goal of significantly increasing regional collaboration to enhance the environmental and economic health of the Gulf of Mexico.

Credit: Earl Nottingham, TPWD

The Gulf of Mexico at a Glance presents memorable representations of selected social, economic, and environmental attributes with the intent of building public awareness about the linkages between the Gulf of Mexico region's ecological health, the high quality of residents' everyday lives, and the economic vitality of the region.

Introduction

The United States portion of the Gulf of Mexico region extends from the Florida Keys westward to the southern tip of Texas, following the coastline of five states. The combined coastline of these states totals over 47,000 miles (when including the shores of all barrier islands, wetlands, inland bays, and inland bodies of water).[1] The Gulf of Mexico has an area of approximately 580,000 square miles, contains an approximate 584,000 cubic miles of water, and has an average depth of 5,299 feet (Nipper et al., 2008).



West Louisiana Gulf shoreline near Rockefeller Refuge. Credit: John Foret

The Gulf of Mexico Alliance is a partnership among the states of Alabama, Florida, Louisiana, Mississippi, and Texas, with the goal of significantly increasing regional collaboration to enhance the environmental and economic health of the Gulf of Mexico. By working together on priority regional issues, the five Gulf States are committed to realizing the benefits of shared management successes and coordinated environmental monitoring and ultimately striving towards a common regional vision and strategy for enhancing the Gulf of Mexico region.

The Gulf of Mexico Alliance actively works to collaborate with the six Mexican Gulf States and is engaged in a number of ongoing activities in Mexico. Both parties acknowledge that the environmental and economic health of the Gulf of Mexico is contingent upon responsible management by both the United States and Mexico.

The Gulf of Mexico at a Glance

One objective of the Gulf of Mexico Alliance is to build public awareness about the linkages between the Gulf region's ecological health, the high quality of residents' everyday lives, and the economic vitality of the region. To this end, *The Gulf of Mexico at a Glance* presents regional aggregations of selected economic activities that are focused in coastal and ocean areas, as well as selected social and environmental attributes of the region. It is hoped that these memorable facts will inspire interested citizens to further explore these subjects and their linkages. While this report addresses only a few key regional attributes, it is also hoped that others will be motivated to develop broader and more in-depth representations. Information in this report is organized by the following themes:

Gulf Communities

Gulf Economy

Gulf Ecology

An aerial view of a shrimp vessel on opening day of shrimp season in Mississippi territorial waters. Credit: Mississippi Department of Marine Resources (June 6, 2002)

Gulf Communities

Coastal regions are among the most densely populated areas in the Nation. Compared to other coastal regions within the United States, the Gulf Coast Region has experienced a considerable population increase since 1970, growing by 103%. This is the second fastest-growing region just behind the Southeast Coast Region, increasing faster than both the Pacific and Northeast Coast Regions.[2] The Gulf of Mexico region is also home to frequent hurricanes, which can adversely affect a growing population. Hurricanes Katrina and Rita displaced thousands of people both temporarily and permanently in 2005. Additionally, the Gulf Coast Region has experienced both tremendous housing unit growth and loss compared to other coast regions in the United States. Fortunately, the Gulf Coast Region's population is rebounding from these events. This section of the report presents population, housing trends, and projections.

Port Lavaca, TX. Credit: Earl Nottingham, TPWD

Gulf Economy

The five U.S. states that border the Gulf of Mexico have a gross domestic product (GDP) of over $2.2 trillion (Bureau of Economic Analysis, 2006), and if a country, this would make the region the seventh largest economy in the world (International Monetary Fund, 2006). The robust economy of the Gulf of Mexico region provides jobs for more than 20 million people. Much of that economic activity is dependent on or related to the Gulf of Mexico and its natural resources. This section of the report presents four key economic activities in the Gulf of Mexico region. Tourism and recreation provide over 620,000 jobs; 27% of domestic crude oil production comes from the Gulf of Mexico region; the major commercial fishing ports of the region bring in over 1.2 billion pounds of fresh seafood every year; and six of the top 10 leading shipping ports in the country are found in the Gulf of Mexico region. These facts highlight the importance of the Gulf of Mexico regtion to the entire Nation and countries around the globe.

Port of Corpus Christi, TX. Credit: Port of Corpus Christi Authority

Gulf Ecology

The Gulf of Mexico is the ninth largest water body in the world and teems with sea life, from shrimp to unexplored deep-water corals living thousands of feet below the surface. The Gulf's size and unique ecologic diversity has led to the establishment of many state and national parks and habitat and wildlife preservation areas. Its coastal areas contain half the wetlands in the United States and are home to vital natural resources, including nesting waterfowl, colonial waterbird rookeries, sea turtles, and fisheries. These resources are supported by the abundant bays, estuaries, tidal flats, barrier islands, hard and soft wood forests, and mangrove forests. Biological diversity is not bound by political boundaries and to illustrate its distinct landscapes and habitats, the Gulf of Mexico region is presented as "ecoregions" in this report. Ecoregions are large areas with similar ecosystems, reflecting patterns of biotic and abiotic factors such as geology, landforms, hydrology, soils, climate, vegetation, land use, and wildlife. The Gulf of Mexico region's ecological communities are essential to sustaining local economies, recreational experiences, and overall quality of life. However, these communities are susceptible to human and natural impacts.

Wetlands in Louisiana. Credit: NOAA

Data

The demographic, economic, and environmental data presented in this report represent information that is most readily available and feasible to obtain. This report provides a snapshot of the most current data available and is intended to highlight a variety of socioeconomic and environmental attributes of the Gulf of Mexico region. Economic activities are not necessarily ocean or coastal dependent, but serve the residents of and visitors to these coastal areas. The 2005 hurricane season had a tremendous impact on the Gulf of Mexico's communities, economy, and ecology, and the data in this report reflect this impact. To acknowledge this catastrophic event, the authors present multi-year averages where possible and also provide descriptions of population and housing changes resulting from the effects of the 2005 hurricane season. It is worth noting, however, that discussions and/or qualifiying statements of the hurricanes' impacts are not provided with all socioeconomic data presented. The demographic projection data presented in this report were generated by Woods and Poole Economics, Inc. The projections listed are intended to regionally highlight where change is likely to occur and are not intended to be interpreted as future predictions. All data sources are cited with references available at the end of this report.

Geography

Throughout this report, data are presented at several levels of geography: region, state, and coastal county. For the purposes of this report, Gulf of Mexico coastal counties were chosen to represent what is hereafter referred to as the "Gulf Coast Region." To be included as "coastal," one of the following criteria must be met: (1) at a minimum, 15% of the county's total land area is located within a coastal watershed or (2) a portion of or an entire county accounts for at least 15% of a U.S. Geological Survey coastal cataloging unit.[3] The Gulf Coast Region contains a total of 141 coastal counties across the five U.S. Gulf States. For a complete map displaying coastal counties of the Gulf Coast Region, see the Appendix.

Gulf Communities

Population

The Gulf Coast Region is increasingly becoming an attractive area for both retirees and job hunters, offering a pleasant climate and new opportunities for its residents. This region has shown a considerable rate of growth over the past 40 years and is expected to grow at this rate in the upcoming decades.

Credit: Earl Nottingham, TPWD

Estimated Population Characteristics of the Gulf Coast Region in 2008

20,528,556	Total population
51%	Female population
49%	Male population
38 years	Average median age
8,086,400	Total number of households
2.6 persons	Average size of households
$77, 068	Mean household income
57%	Employed population *(U.S. employed populaton is 60%)*

Source: Woods and Poole Economics, Inc., 2007.

Estimated Population Density of the Gulf Coast Region in 2008

Pinellas County, FL, is the leading county in the Gulf Coast Region in terms of population density, averaging 3,365 persons per square mile.

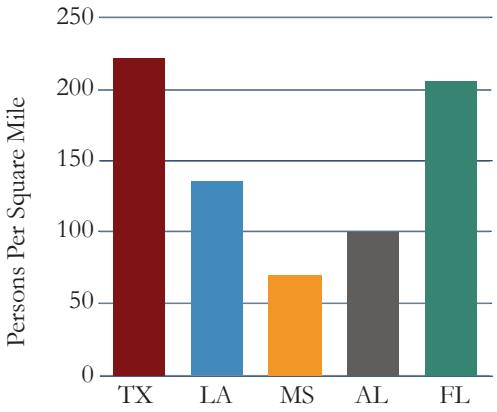


Figure 1. Population density in the Gulf Coast Region by state.
Source: Woods and Poole Economics, Inc., 2007.

The Gulf Coast Region is the second leading U.S. coastal region in percent population change from 1970 to 2008, growing by 103%.

10,411,000
Approximate increase in population in the Gulf Coast Region since 1970.

10
Expected percent increase in population in the Gulf Coast Region by 2015. The U.S. total populaton is expected to increase by 7%.

178
Population density of the Gulf Coast Region (persons per square mile). The U.S. coastal county population density is 311 persons per square mile (excluding Alaska).

25
Approximate percentage of the population that is considered part of the "baby boomer" generation. Of this population, approximately 65% will reach retirement (age 65) by 2015.

Source: Woods and Poole Economics, Inc., 2007.

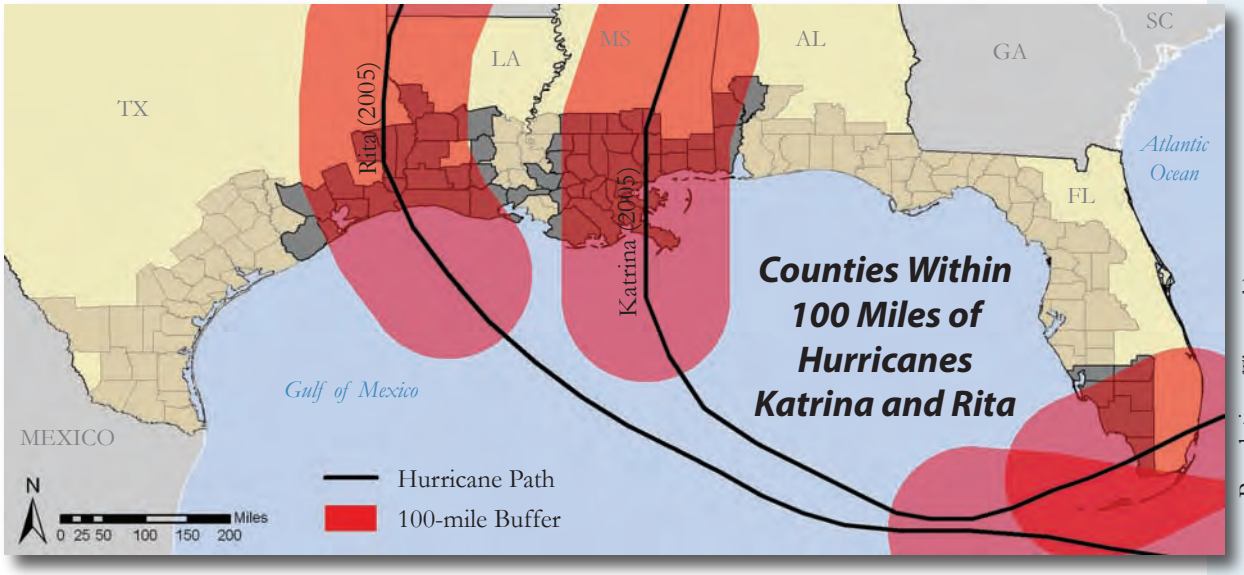


Figure 2. Gulf of Mexico coastal counties within a 100-mile buffer of the tracks of Hurricanes Katrina and Rita (2005).
Source: Coastal Services Center, NOAA, 2008.

Both Hurricanes Katrina and Rita had a tremendous effect on the Gulf Coast Region's population in 2005. A total of 60 Gulf coastal counties were within 100 miles of both hurricane paths. The graph below demonstrates the changes in population within these combined counties from 2004 to 2008 and projected change to 2015.

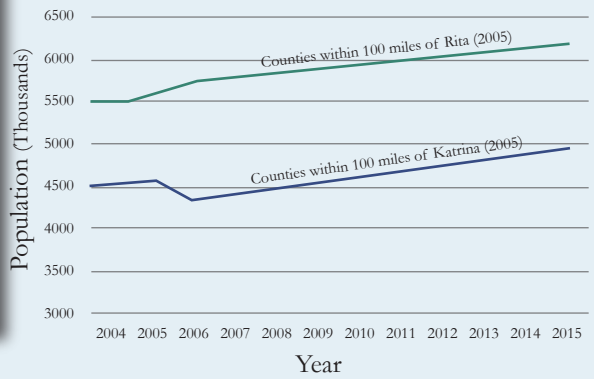
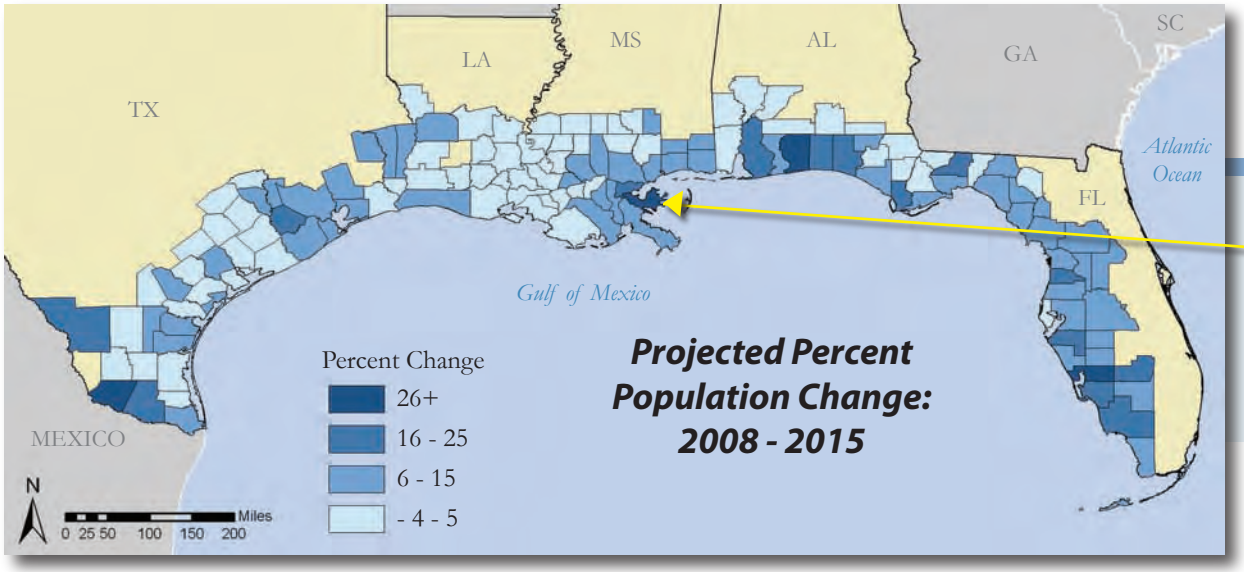


Figure 3. Population change of coastal counties within 100 miles of the tracks of Hurricanes Katrina and Rita.
Source: Woods and Poole Economics, Inc., 2007; Coastal Services Center, NOAA, 2008.



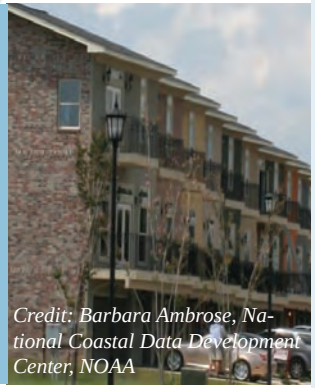
Although a significant number of residents left St. Bernard Parish, LA, following Hurricane Katrina, the parish is projected to experience a high level of return in the coming decade: the highest percent increase in population is expected to occur in St. Bernard Parish, growing by 89% by 2015.

Figure 4. Expected percent population change from 2008 to 2015 in the Gulf Coast Region.
Source: Woods and Poole Economics, Inc., 2007.

Gulf Communities

Housing and Development

Residential development in the Gulf Coast Region is increasing. Construction of housing units may act as an indicator of economic growth, "sprawl" along the coast, or the rebuilding of previous housing units lost. People nationwide are drawn to the Gulf Coast Region as a vacation destination; therefore, one component of this development is seasonal homes.[4]



Credit: Barbara Ambrose, National Coastal Data Development Center, NOAA

Percent of Housing Units in the Gulf Coast Region

Leading counties in the Gulf Coast Region in total number of housing units:

Harris County, TX	1,495,016
Hillsborough County, FL	505,654
Pinellas County, FL	498,415

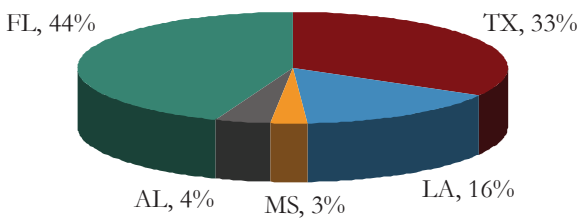


Figure 5. Percent of Gulf Coast Region housing units by state.
Source: U.S.Census Bureau, 2007a.

Seasonal Homes in the Gulf Coast Region

Counties in the Gulf Coast Region with the highest percentage of seasonal homes:

Kenedy County, TX	37%
Walton County, FL	27%
Cameron County, LA	27%

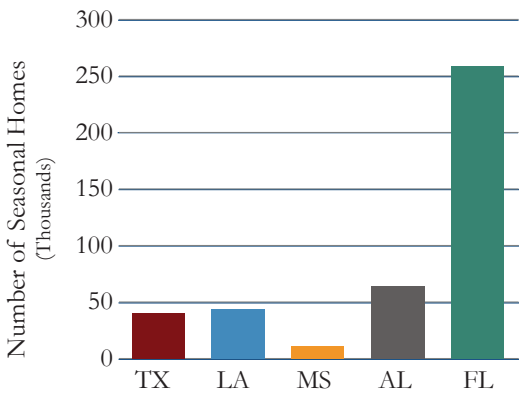


Figure 6. Seasonal housing units in the Gulf Coast Region by state.
Source: U.S. Census Bureau, 2000.

Harris County, Texas, led the Nation in building permits issued from 2002 to 2006 with a total of 143,000.

Source: U.S. Census Bureau, 2003, 2004, 2005, 2006, 2007b.

8

Percent increase in the number of housing units from 2002 to 2006 in the Gulf Coast Region. Total number of housing units in the entire U.S. increased by 6%.
Source: U.S. Census Bureau, 2007a.

827,000

Approximate number of building permits issued for new single family home construction from 2002 to 2006 in the Gulf Coast Region.
Source: U.S. Census Bureau, 2003, 2004, 2005, 2006, 2007b.

26

Percent of the Nation's coastal county building permits that were issued in the Gulf Coast Region (single family units only).
Source: U.S. Census Bureau, 2003, 2004, 2005, 2006, 2007b.

5

Percent of all housing units in the Gulf Coast Region that are seasonal.
Source: U.S. Census Bureau, 2000.

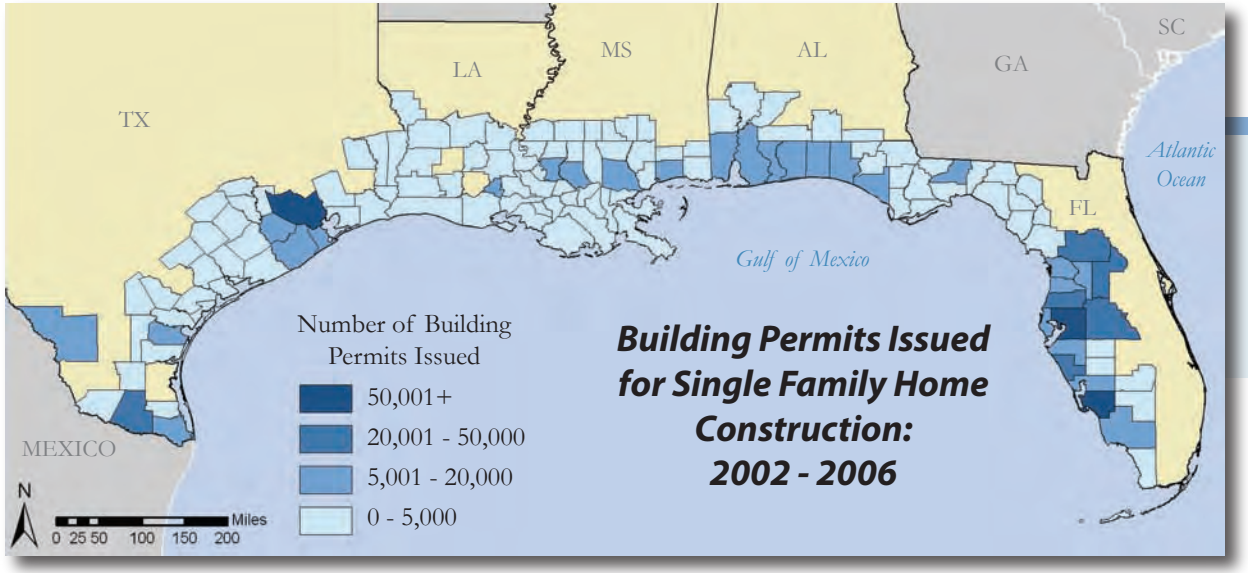


Figure 7. Building permits issued from 2002 to 2006 in the Gulf Coast Region.
Source: U.S. Census Bureau, 2003-2006, 2007b.

Three of the ten leading counties in building permits issued nationally were located in the Gulf Coast Region:

Harris County, TX
Lee County, FL
Hillsborough County, FL

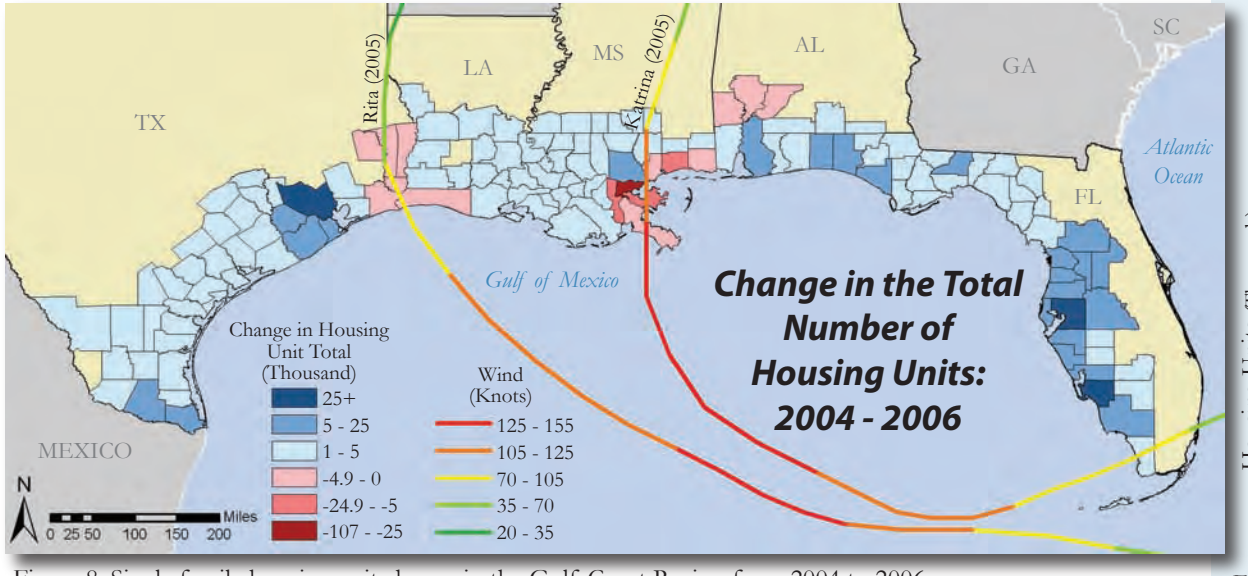


Figure 8. Single family housing unit change in the Gulf Coast Region from 2004 to 2006.
Source: U.S. Census Bureau, 2007a; Coastal Services Center, NOAA, 2008.

In addition to the population changes the Gulf Coast Region experienced as a result of Hurricanes Katrina and Rita, housing was also considerably altered. The graph below demonstrates the changes in the number of housing units located in the combined coastal counties found within 100 miles of both the tracks of Hurricanes Katrina and Rita from 2004 to 2006.

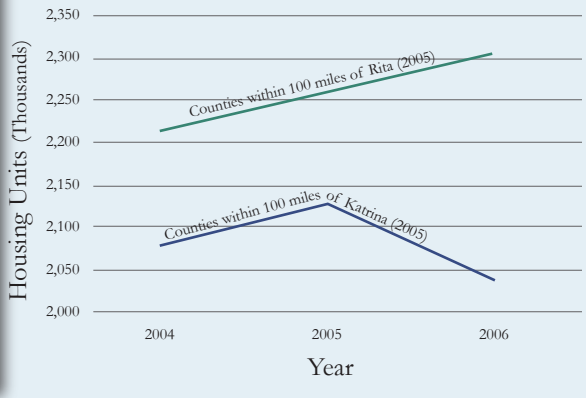


Figure 9. Housing unit change in coastal counties found within 100 miles Hurricanes Katrina and Rita.
Source: U.S. Census Bureau, 2007a; Coastal Services Center, NOAA, 2008.

Gulf Communities

Coastal Vulnerability

Predicted sea-level rise may cause physical changes to the coast, which could adversely impact communities and infrastructure located along the Gulf of Mexico.

Being aware of the relative vulnerability of coastal areas to sea-level rise-related erosion, flooding, and storm damage will help communities to consider the longer-term costs of protecting or relocating themselves. The preliminary assessment presented here, conducted by the U.S. Geological Survey, describes how vulnerable the Gulf of Mexico region might be to sea-level rise.

It is certain that Gulf coastal communities will continue to experience significant, destructive coastal storms. By transforming into "resilient" communities, they increase their ability to "bounce back" after hurricanes and flooding. Resilient communities, with the ability to quickly recover both economically and socially, will be critical to the region's long-term viability and success in the face of predicted sea-level rise.

View of Mississippi River and south Plaquemines Parish, LA, after Hurricane Katrina (2005). Credit: NOAA

Coastal Vulnerability to Sea-level Rise

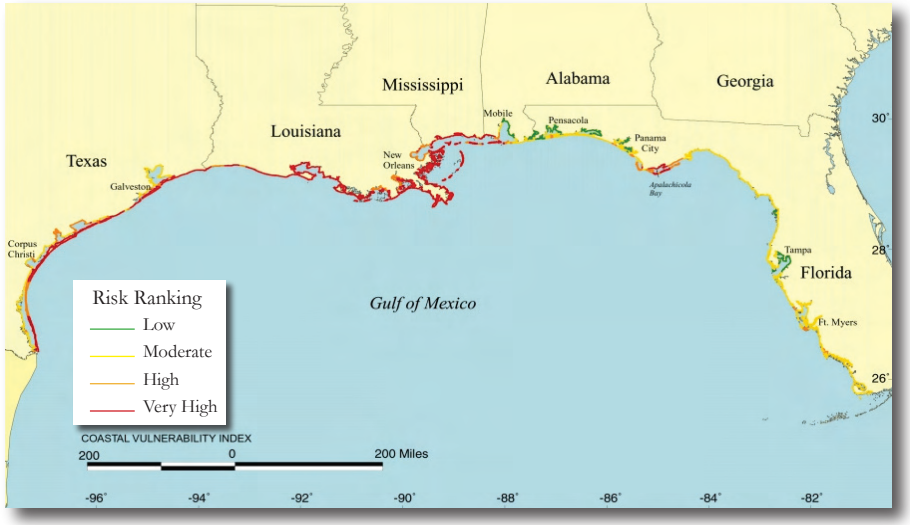


Figure 10. Coastal vulnerability in the Gulf of Mexico region (based on the Coastal Vulnerability Index[5] (C.V.I.)). The C.V.I. shows the relative vulnerability of the coast to physical changes due to predicted rise in sea level.
Source: Thieler and Hammer-Klose, 2006.

Gulf of Mexico Shoreline by Coastal Vulnerability Risk Category

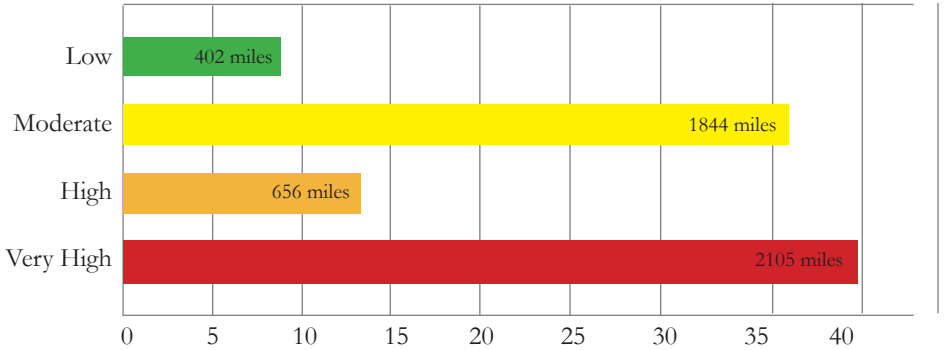
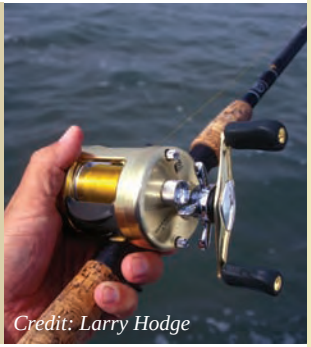


Figure 11. Percentage of mapped shoreline along the U.S. Gulf of Mexico coast in each risk category based on the C.V.I. (including length of shoreline in each category).
Source: Thieler and Hammer-Klose, 2006.

Gulf Economy

Recreational Fishing

From flyfishing shallow-water flats for red drum to fishing along structures and reefs for groupers, the Gulf of Mexico offers a variety of diverse habitats and species for those seeking a recreational fishing adventure. Both residents and tourists are drawn to these inland and open-water opportunities.


Credit: Larry Hodge

Distribution of Marine Recreational Fishing Trips

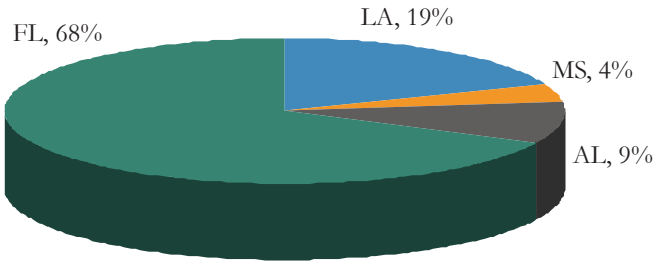


Figure 12. Percent of the 25 million Gulf of Mexico marine recreational fishing trips in 2006 by state.
Source: National Marine Fisheries Service, NOAA, 2007b.
Note: The state of Texas does not participate in the Marine Recreational Fishery Statistical Survey.

Top Five Marine Recreational Fishing Species Caught in 2006

Rank	Species	Millions of pounds
1	Spotted seatrout	18.0
2	Red drum	14.2
3	Sheepshead	4.0
4	King mackerel	3.4
5	Red snapper	3.2

Table 1. Top five marine recreational fishing species in the Gulf of Mexico by pounds harvested (harvest values do not include Texas).
Source: National Marine Fisheries Service, NOAA, 2007c.

Credit: Earl Nottingham, TPWD

Credit: Ron Baker, NOAA

The Gulf of Mexico accounted for over 40% of all U.S. marine recreational fishing catch in 2006.

Source: National Marine Fisheries Service, NOAA, 2007c.

28

Percent of total U.S. marine recreational fishing trips taken in the Gulf of Mexico in 2006.
Source: National Marine Fisheries Service, NOAA, 2007c.

25 million

Number of marine recreational fishing trips taken in the Gulf of Mexico during 2006.
Source: National Marine Fisheries Service, NOAA, 2007c.

3.6 million

Number of Gulf of Mexico region residents who took part in marine recreational fishing in 2006.
Source: National Marine Fisheries Service, NOAA, 2007c.

56

Percent of marine recreational fishing harvest that was released out of a total catch of 193 million fish in the Gulf of Mexico during 2006 (harvest value does not include Texas).
Source: National Marine Fisheries Service, NOAA, 2007b.

Gulf Economy

Commercial Fishing

The commercial fishing industry in the Gulf of Mexico region has long supported the livelihood of its residents. This multi-billion dollar industry has traditionally included fin fish, shrimp, oysters, and crab.

Credit: Mississippi Department of Environmental Quality

Distribution of Commercial Fishing Landings

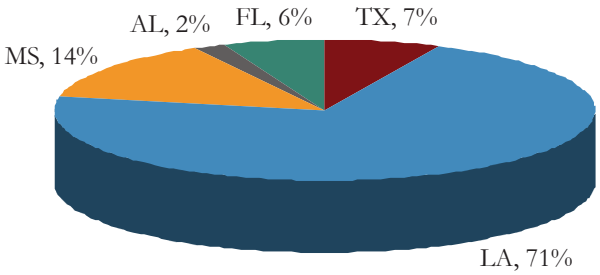


Figure 13. Distribution of the 1.3 billion pounds of commercial fishing landings by state.
Source: National Marine Fisheries Service, NOAA, 2007a.

Distribution of Commercial Fishing Value

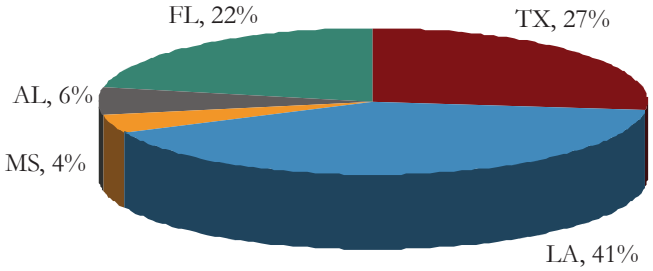


Figure 14. Distribution of the $662 million of commercial fishing value by state.
Source: National Marine Fisheries Service, NOAA, 2007a.

2005 Hurricane Season and Louisiana's Fishing Industry

The 2005 hurricanes damaged and destroyed thousands of commercial vessels and the onshore infrastructure throughout coastal Louisiana, causing sharp declines in commercial landings and revenues. Thus, seafood landings shifted west to Texas and east to Alabama. The Louisiana Department of Wildlife and Fisheries' 2005 preliminary estimates of losses to the state's seafood industry as a result of Hurricane Katrina were $1.3 billion (annual total retail value), which represents about 40% of the industry's annual total retail value (Wulfhorst, 2005). *Source: National Marine Fisheries Service, NOAA, 2007d.*

In 2006, three of the top six commercial fishing ports in the U.S. by landings were located in the Gulf of Mexico region.

83

Percent of total U.S. shrimp landings in the Gulf of Mexico region, a three-year average of 254 million pounds.

56

Percent of total U.S. oyster landings in the Gulf of Mexico region (a three-year average of 22 million pounds).

14

Percent of total U.S. commercial fishery landings in the Gulf of Mexico region (Alaska accounts for 57% of all landings).

1.3 billion

Average number of pounds of commercial fishery landings per year in the Gulf of Mexico region, yielding a value of $662 million.

Source: National Marine Fisheries Service, NOAA, 2007a.

Figure 15. Locations of the ten most productive fishing ports in the Gulf of Mexico region (by value).
Source: National Marine Fisheries Service, NOAA, 2007e.

Shrimp boats in Pass Christian Harbor, MS. Credit: Barbara Ambrose, National Coastal Data Development Center, NOAA

Most Productive Fishing Ports by Value

Rank	Port	Millions of Dollars
1	Empire-Venice, LA	46.9
2	Brownsville-Port Isabel, TX	45.8
3	Dulac-Chauvin, LA	44.4
4	Key West, FL	44.2
5	Port Arthur, TX	39.3
6	Galveston, TX	34.8
7	Bayou La Batre, AL	32.6
8	Intracoastal City, LA	32.2
9	Palacios, TX	29.8
10	Golden Meadow-Leeville, LA	28.1

Table 2. The 10 most productive fishing ports in the Gulf of Mexico region by value, a three-year average from 2004 to 2006.
Source: National Marine Fisheries Service, NOAA, 2007f.

Most Productive Fishing Ports by Poundage

Rank	Port	Millions of pounds
1	Intracoastal City, LA	388.8
2	Empire-Venice, LA	278.5
3	Pascagoula-Moss Point, MS	178.0
4	Cameron, LA	87.3
5	Dulac-Chauvin, LA	37.9
6	Brownsville-Port Isabel, TX	23.1
7	Golden Meadow-Leeville, LA	22.7
8	Bayou La Batre, AL	21.5
9	Port Arthur, TX	20.7
10	Lafitte-Barataria, LA	19.2

Table 3. The ten most productive fishing ports in the Gulf of Mexico region by poundage, a three-year average from 2004 to 2006.
Source: National Marine Fisheries Service, NOAA, 2007e.

Top Species Landings by Poundage

Rank	Species	Millions of pounds
1	Menhaden	913.4
2	Brown Shrimp	117.8
3	White Shrimp	114.6
4	Blue Crab	58.9
5	Eastern Oyster	21.6

Table 4. The top five species landings by poundage in the Gulf of Mexico region, a three-year average from 2004 to 2006.
Source: National Marine Fisheries Service, NOAA, 2007a.

Gulf Economy

Tourism and Recreation

The white sand beaches, excellent seafood restaurants, and warm weather found in the Gulf of Mexico region make it a popular destination for people from around the country and the world. Tourism and recreation have become very important to the economy of the region.

Credit: Melissa Schneider

There are over 620,000 jobs, yielding over $9 billion in tourism and recreation wages paid each year in the Gulf Coast Region.

87

Percent of tourism and recreation jobs in the Gulf Coast Region created by eating and drinking establishments.

8

Percent of employment in the Gulf Coast Region in the tourism and recreation fields.

Source: Bureau of Labor Statistics, 2006; Colgan, 2004.

Distribution of Tourism and Recreation Employment

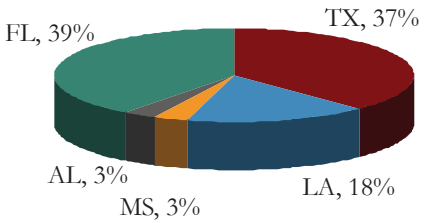


Figure 16. Distribution of 620,000 tourism and recreation jobs in the Gulf Coast Region by state.
Source: Bureau of Labor Statistics, 2006; Colgan, 2004.

Tourism and Recreation Jobs and Average Annual Pay in the Gulf Coast Region

Industry	Number of Jobs	Total Wages (millions)
Eating and Drinking Establishments	537,160	$4,835
Hotels and Lodging	59,759	$1,363
Amusement and Recreation Services	10,530	$185
Boat Dealers	4,578	$164
Marinas	2,687	$89
Scenic Water Tours	946	$26
Rec. Vehicle Parks and Campsites	989	$19
Sporting Goods	495	$17
Zoos, Aquaria	3,344	$90

Table 5. Total number of jobs and average annual pay for tourism and recreation jobs in the Gulf Coast Region.
Source: Bureau of Labor Statistics, 2006; Colgan, 2004.

Days at the Beach

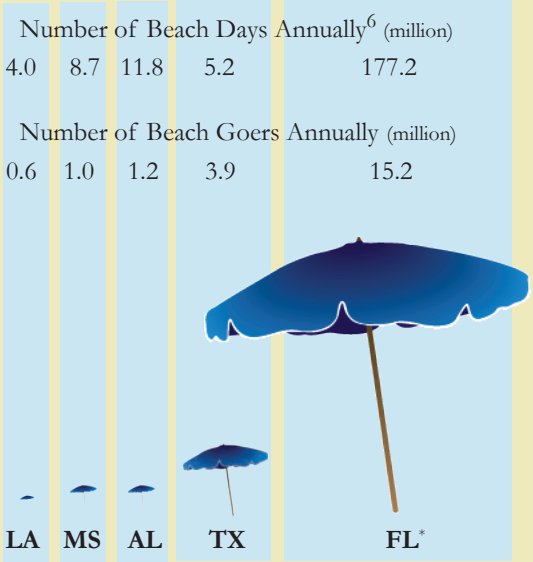


Figure 17. Beach visitation by state, 2000.
* Florida numbers include the Atlantic Coast
Source: National Ocean Service, NOAA, 2000.

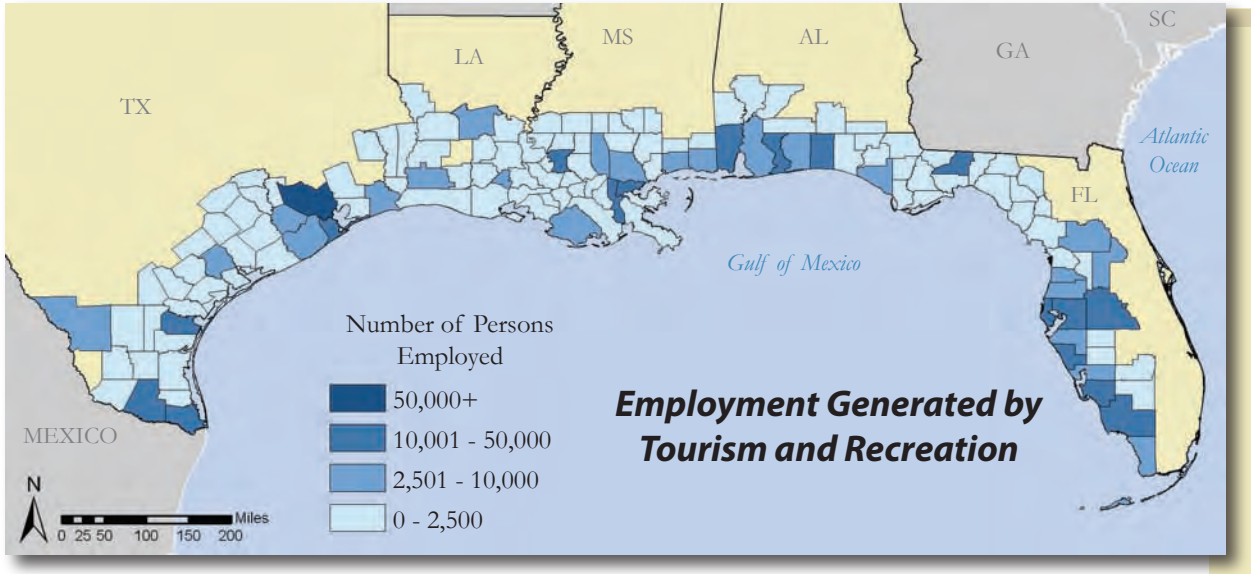


Figure 18. Employment generated by tourism and recreation in the Gulf Coast Region.
Source: Bureau of Labor Statistics, 2006; Colgan, 2004.

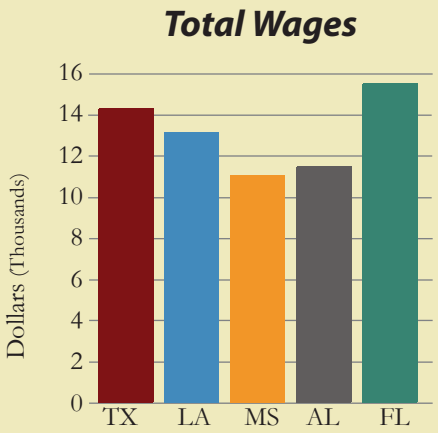


Figure 19. Total wages for tourism and recreation-related jobs in the Gulf Coast Region (data not normalized for length of season).
Source: Bureau of Labor Statistics, 2006; Colgan, 2004.

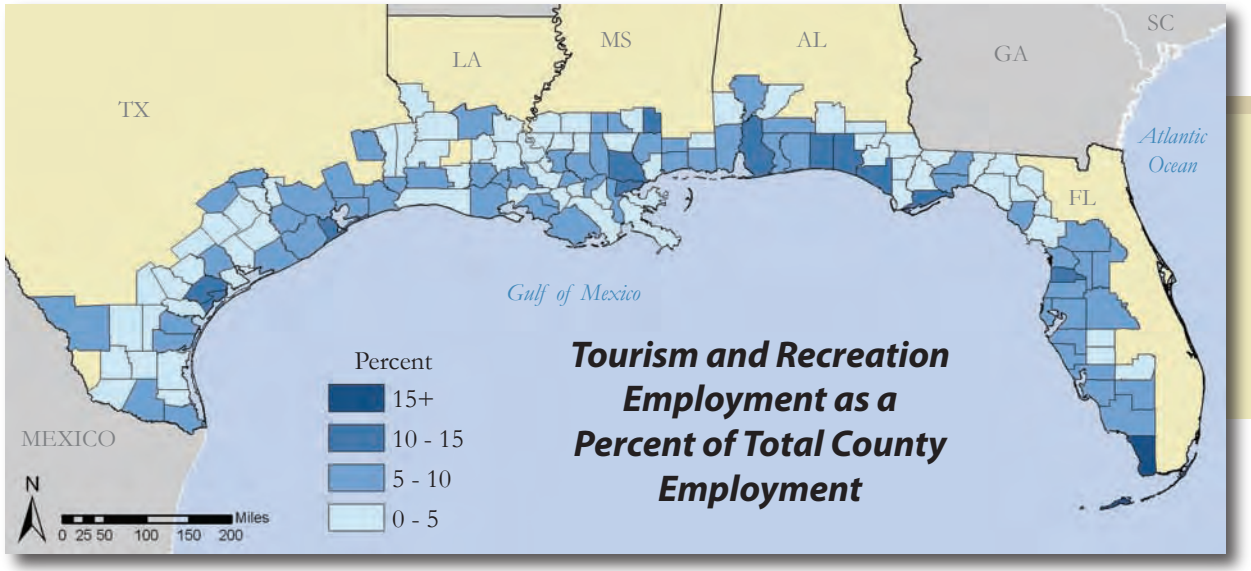


Figure 20. Percent of county employment generated by tourism and recreation in the Gulf Coast Region.
Source: Bureau of Labor Statistics, 2006; Colgan, 2004.

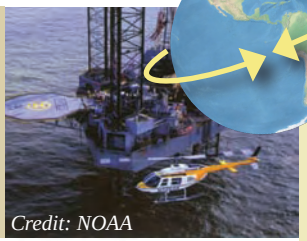
Leading counties in percent employment generated by tourism and recreation

Monroe County, FL	29%
Orleans County, LA	18%
Franklin County, FL	14%
Okaloosa County, FL	12%
Refugio County, TX	11%

Gulf Economy

Oil and Gas Production

The Gulf of Mexico region's oil and gas industry is one of the most developed in the world.


Credit: NOAA

f placed end to end, the oil and gas pipelines in the Gulf of Mexico could wrap around the Earth's equator.

Source: Minerals Management Service, 2008a.

Crude Oil Production

27% of U.S. total

Oil platforms in the Gulf of Mexico. Credit: NOAA

Natural Gas Production

37% of U.S. total

Natural gas platforms visible from Dauphin Island, AL, beaches. Credit: Melissa Schneider

Crude Oil Refinery Capacity

47% of U.S. total

Galveston Bay, TX refinery. Credit: TPWD

Figure 21. Share of U.S. energy production and refining capacity within the states of Florida, Alabama, Mississippi, Louisiana, and Texas, as percentages of the total U.S. share (these percentages represent the entire states, not just the coastal region of these states).
Source: Energy Information Administration, 2008.

25,000

Approximate miles of active oil and gas pipeline on the Gulf of Mexico sea floor.
Source: Minerals Management Service, 2008a.

4,019

Approximate number of Gulf of Mexico oil and gas platforms.
Source: Minerals Management Service, 2008b.

107,210

Reported petroleum-related workers employed in the Gulf Coast Region.
Source: Bureau of Labor and Statistics, 2006.

12.7 billion

Total wages earned by those working in the oil and gas industry in the Gulf Coast Region.
Source: Bureau of Labor and Statistics, 2006.

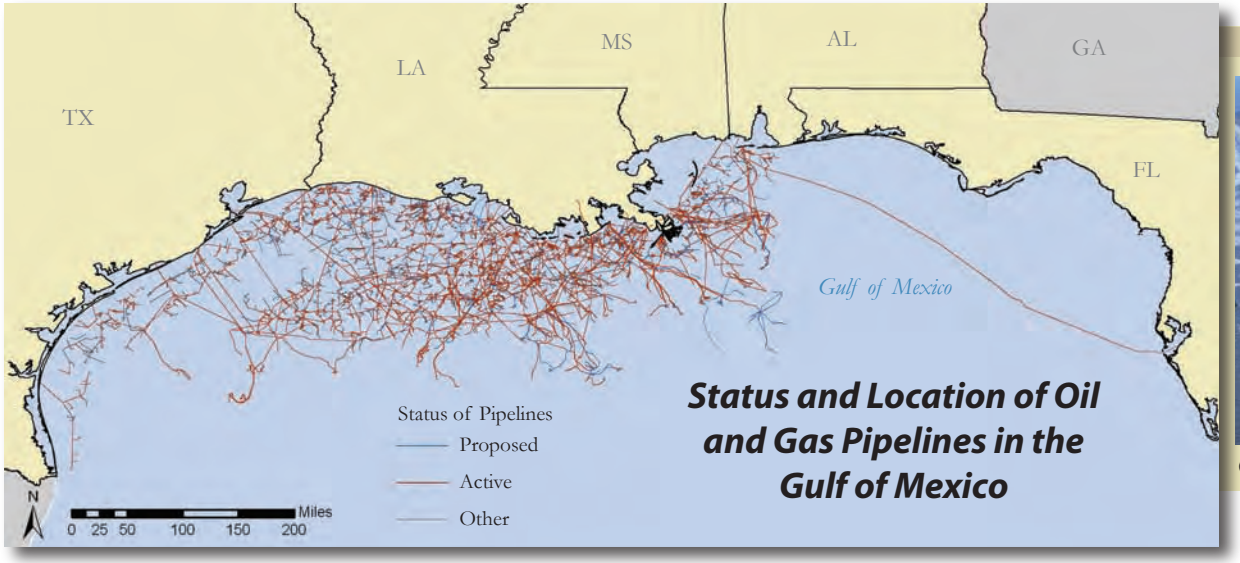


Figure 22. Oil and gas pipelines in the Gulf of Mexico.
Source: Minerals Management Service, 2008a.

Oil tanks near Fourchon Beach, LA. Credit: NOAA

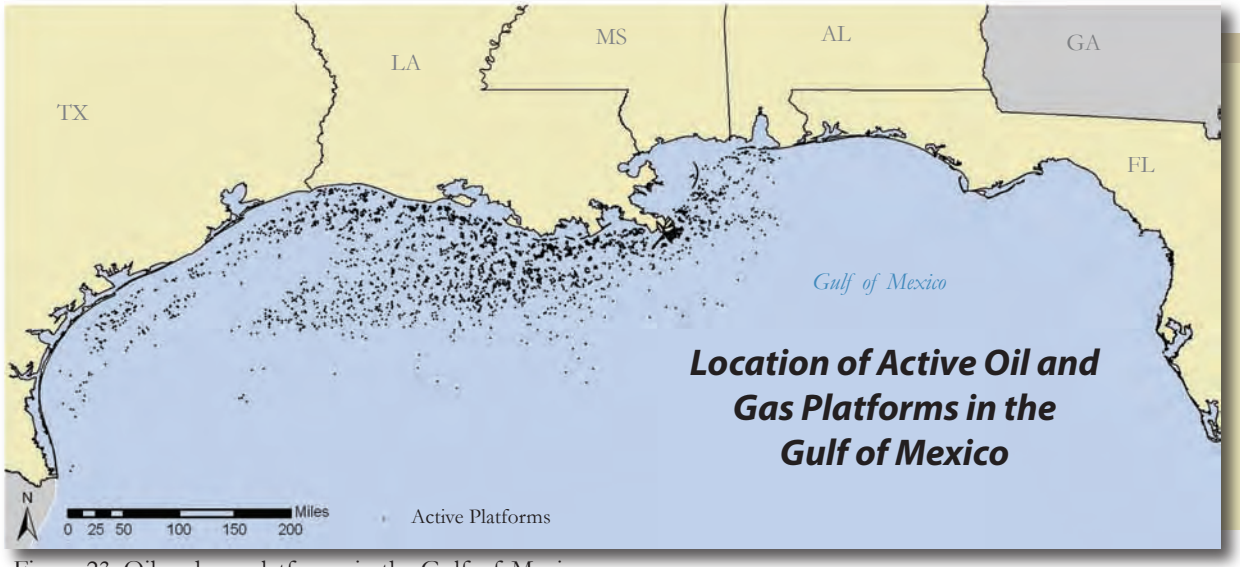


Figure 23. Oil and gas platforms in the Gulf of Mexico.
Source: Minerals Management Service, 2008b.

Natural gas platforms off the coast of Dauphin Island, AL. Credit: Mary Kate McKenna

Gulf Economy

Waterborne Commerce

The U.S. economy relies heavily on the ports in the Gulf of Mexico region for the import and export of both foreign and domestic goods. The Gulf of Mexico region supports several ports that lead the Nation in total commerce.

Credit: Mike Henderson, NOAA

Top Ten Ports in the United States Ranked by Tonnage in 2006

Rank	Port	Millions of Short Tons*
1	South Louisiana, LA	225.5
2	Houston, TX	221.1
3	New York, NY and NJ	157.6
4	Long Beach, CA	84.4
5	Beaumont, TX	79.5
6	Corpus Christi, TX	77.6
7	Huntington – Tristate, WV-OH-PA	77.2
8	New Orleans, LA	76.9
9	Los Angeles, CA	66.0
10	Mobile, AL	59.8

Table 6. Leading U.S. ports in 2006 by tonnage.
*Note: The short ton (S/T) is a unit of mass equal to 2,000 pounds (exactly 907.18474 kilograms). This is different than a metric ton, which is equal to 1,000 kilograms.
Source: USACE, 2007a (the USACE reports on the top 100 ports in the Nation).

Gulf Intracoastal Waterway. Credit: TPWD

Six of the Nation's 10 leading ports in 2006 for tonnage are located in the Gulf of Mexico region.

Source: USACE, 2007a.

1 and 2

Respective ranks of Texas and Louisiana in U.S. waterborne traffic in 2005.
Source: USACE, 2007c.

54

Number of miles the Port of South Louisiana stretches along the Mississippi River. The port was ranked first in the U.S. in 2005 for total tonnage and is the largest tonnage port in the Western Hemisphere. In 2006, tonnage was up 6.2% from 2005, registering the single highest total in the history of the port with 225.5 million tons.
Source: USACE, 2007c.

1,109

Number of miles the Gulf Intracoastal Waterway extends, greater than the distance from Washington, DC, to Miami, FL. The waterway is a dredged canal spanning from Florida to Texas, linking commerce along all five U.S. Gulf of Mexico states.
Source: USACE, 2007c.

49.5

Million cubic yards dredged by the U.S. Army Corps of Engineers in 30,000 square miles of south central and coastal Louisiana for 2005. The amount dredged could fill every football field in the state of Mississippi - more than 280 high school, college, and municipal stadiums - 100 yards long, 50 yards wide, and approximately 10 stories high.
Source: USACE, 2007b.

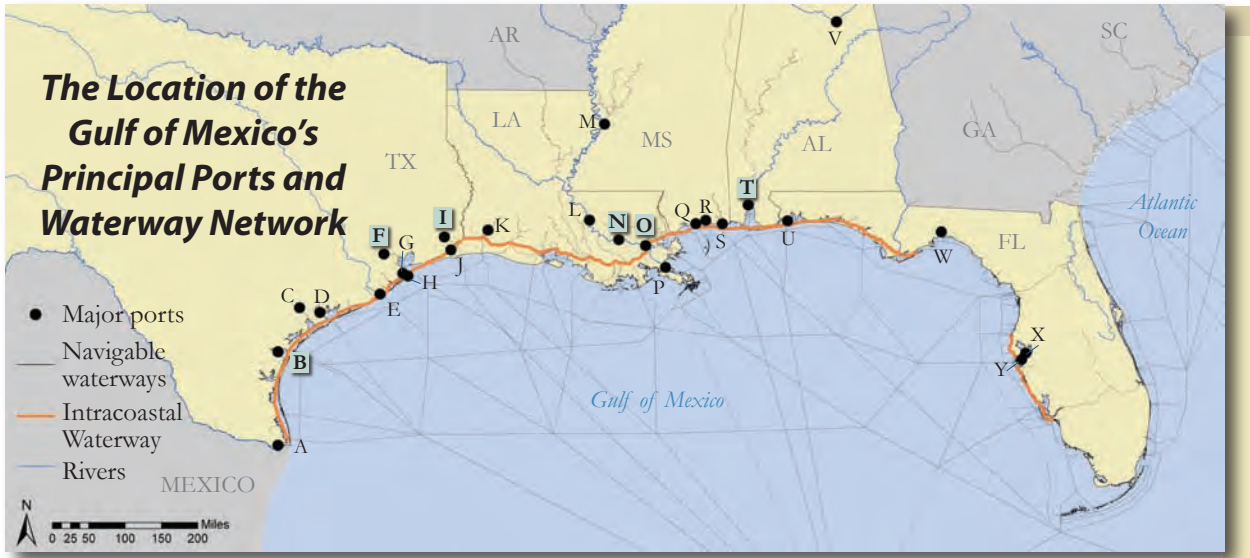


Figure 24. The location of the Gulf of Mexico's principal ports and shipping lanes. Principal ports are determined by the amount of total commerce in short tons.
Source: USACE, 2007a, 2007d.

Six of the Gulf of Mexico region's principal ports rank among the Nation's top 10 leading ports (by tonnage).

A	Brownsville
B	Corpus Christi
C	Victoria
D	Matagorda Ship Channel
E	Freeport
F	Houston
G	Texas City
H	Galveston
I	Beaumont
J	Port Arthur
K	Lake Charles
L	Baton Rouge
M	Vicksburg
N	Port of South Louisiana
O	New Orleans
P	Port of Plaquemine
Q	Gulfport Commercial Harbor
R	Biloxi
S	Pascagoula
T	Mobile Harbor
U	Pensacola
V	Guntersville
W	Panama CIty
X	Tampa Bay
Y	Charlotte Harbor

Port Fourchon, located in south Louisiana along the Gulf of Mexico shoreline, is the point of transfer for approximately 75% of oil and gas produced within the Gulf outer continental shelf.
Credit: Greater Lafourche Port Commission, 2006

Port of Corpus Christi, TX. Credit: Port of Corpus Christi Authority

Gulf Ecology

Celebrating Diversity

The Gulf of Mexico is home to diverse habitats, many unique to the Nation and the world.

Barrier Islands

Barrier islands are formations of sand, shell, and gravel that exist along coasts. These islands form a defense against winds and waves and provide habitat for many species of animals. Padre Island, TX, is 130 miles long and is the world's longest barrier island. Kemp's Ridley turtle, which has long been considered the most endangered sea turtle in the world, is known to nest there.

Credit: Joseph Tomaselli

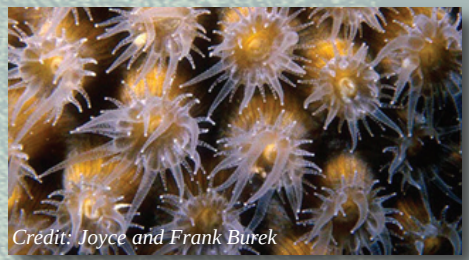
Hypersaline Lagoons

Hypersaline lagoons are characterized by little to no inland water flow and high rates of evaporation. Combined with the Laguna Madre of Tamaulipas, Mexico, Laguna Madre in Texas is the largest hypersaline system in the world. This area is home to the only strain of high-salinity adapted oysters in North America. Additionally, nearly 80% of all seagrass beds in Texas are found in the Laguna Madre.

Credit: Texas Parks and Wildlife Department © 2006

Coral Reefs

The Flower Garden Banks National Marine Sanctuary encompasses a variety of habitat types, including the northern-most coral reefs in the continental United States. Located about 110 miles directly south of the Texas/Louisiana border, more than 300 acres of protected high-relief reefs are home to more than 23 species of coral, 250 reef invertebrates, 175 fishes, and 80 algae species.



Credit: Joyce and Frank Burek

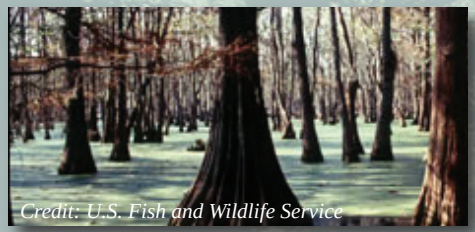
Wetlands and Marshes

The wetlands and marshes in southern Louisiana act as a buffer to help moderate flooding and inundation during storm events. Erosion of the Mississippi delta, land subsidence, and rising sea levels threaten these wetlands. Louisiana's coast, which contains 40% of the Nation's wetlands, is disappearing into the Gulf of Mexico at a rate of 35 square miles a year, or the equivalent of a football field every 20 minutes.

Credit: Barrataria-Terrebone National Estuary Program, 2005

Cypress-Tupelo Swamps

In southern swamps, the two dominant trees are bald cypress and water tupelo and these areas are often referred to as cypress-tupelo swamps. Cypress-tupelo swamps are flooded year round, and only dry out during the most severe droughts. In the Atchafalaya National Wildlife Refuge, LA, these swamps provide vital nesting habitat for wood ducks, and support the Nation's largest concentration of American woodcock.



Credit: U.S. Fish and Wildlife Service

White Sand Beaches

The Gulf Islands National Seashore (the Nation's largest) is comprised of both Florida and Mississippi beaches. The stunning white sand found on these beaches is composed of fine quartz eroded from granite in the Appalachian Mountains. The sand is carried to the Gulf by rivers and creeks and deposited along the beach by currents.

Credit: National Park Service

Oyster Reefs

Today in Alabama, oysters are harvested by the traditional method of tonging. This is carried out from small boats by using tongs (rakes on the ends of long wooden poles) to gather and hold the oysters until they are lifted on board. Much of the oyster tonging in Alabama is conducted on public oyster reefs, but increasing numbers of oysters are cultured in waters adjacent to privately owned land.

Credit: NOAA

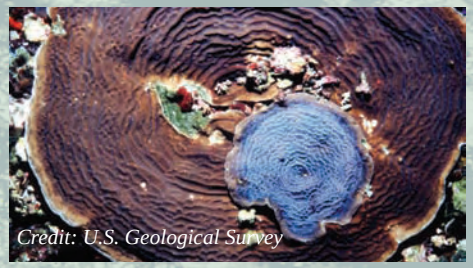
Mangrove Forests

Red mangrove, black mangrove, and white mangrove are the three species of mangrove trees that grow in Florida, particularly in the Florida Keys. Mangroves grow in saltwater and in areas frequently flooded by saltwater. These trees provide protected habitat, breeding grounds, and nursery areas for many land and marine animals. Mangroves can also provide vital shoreline protection from wind, waves, and erosion.

Credit: Renee Wilson, Rookery Bay National Estuarine Research Reserve, NOAA

Deep Coral Reefs

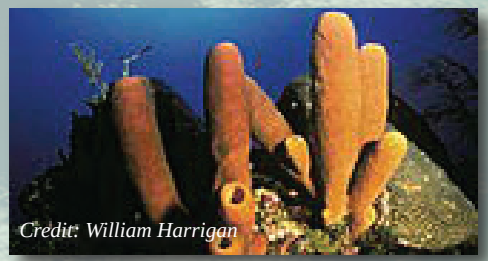
At more than 60 miles in length and 60 to 80 meters deep, Pulley Ridge is a series of drowned barrier islands on the southwest Florida Shelf. Unusual at this depth, the southern portion of the ridge is home to a variety of corals; green, red, and brown macroalgae; and shallow-water tropical fishes. From the scientific perspective, southern Pulley Ridge may be the deepest coral reef in the United States.



Credit: U.S. Geological Survey

Sponge Beds

During the early part of this century, the sponge fishery was very important to Florida's economy. Of the five sponge species harvested commercially in Florida, sheepswool is the most important because of its durability and softness. Commercial sponges are found in both the Florida Keys and the northern Gulf, with approximately 60,000 - 70,000 pounds of sponges harvested annually.



Credit: William Harrigan

Credit: SeaWiFS Project, NASA/Goddard Space Flight Center, and ORBIMAGE

Gulf Ecology

Ecoregions and Threats[7]

The Gulf of Mexico region is a rich mosaic of natural landscapes, agriculture, and an assortment of towns and cities. The region's diversity provides abundant opportunities for uses like conservation, recreation, and commerce. Yet, at times, that very mix creates challenges in balancing these competing uses.

Southern Texas Plains

This region of thornscrub and sparse grassland is locally known as the brush country. It comprises rolling plains and has a more distinct diversity of plant and animal life.

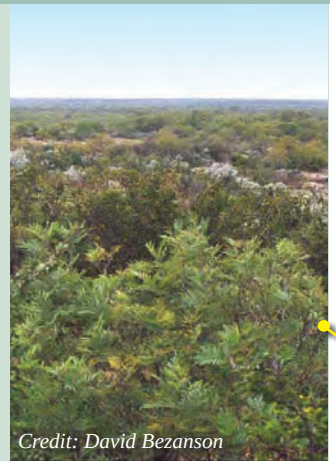
This region includes:

- Mesquite-grass
- Woody plants
- Cacti and other succulents
- Birds such as Altimira oriole and elf owl
- Rare animals such as the ocelot

Threats to this region:

- Overgrazing and conversion to agriculture
- Loss of native vegetation through controlled burns to make way for crops
- Dam construction

Source: Griffith et al., 2004; World Wildlife Fund, 2001d.



Credit: David Bezanson

Western Gulf Coast Plains

This region is distinguished by flat topography, grassland expanses, and a mild, subtropical climate. The coastal portion is comprised of barrier islands, bays, estuaries, and tidal marshes, and the inland plains contain sparse remnant forest and savanna and cropland.

This region includes:

- Many animal species, of which over 200 are in need of protection
- Endangered Kemp's Ridley sea turtle nests at one beach in the region

Threats to this region:

- Urbanization and industrialization
- Fragmentation of remaining habitat
- Oil and gas production

Source: Griffith et al., 2004; World Wildlife Fund, 2001f.

Credit: U.S. Army Corps of Engineers

Mississippi Alluvial Plain

This region is a flat alluvial plain broken up by river terraces, swales, and natural levees and undergoes regular flooding. The region essentially hugs the Mississippi River from the Gulf to the southern tip of Illinois.

This region includes:

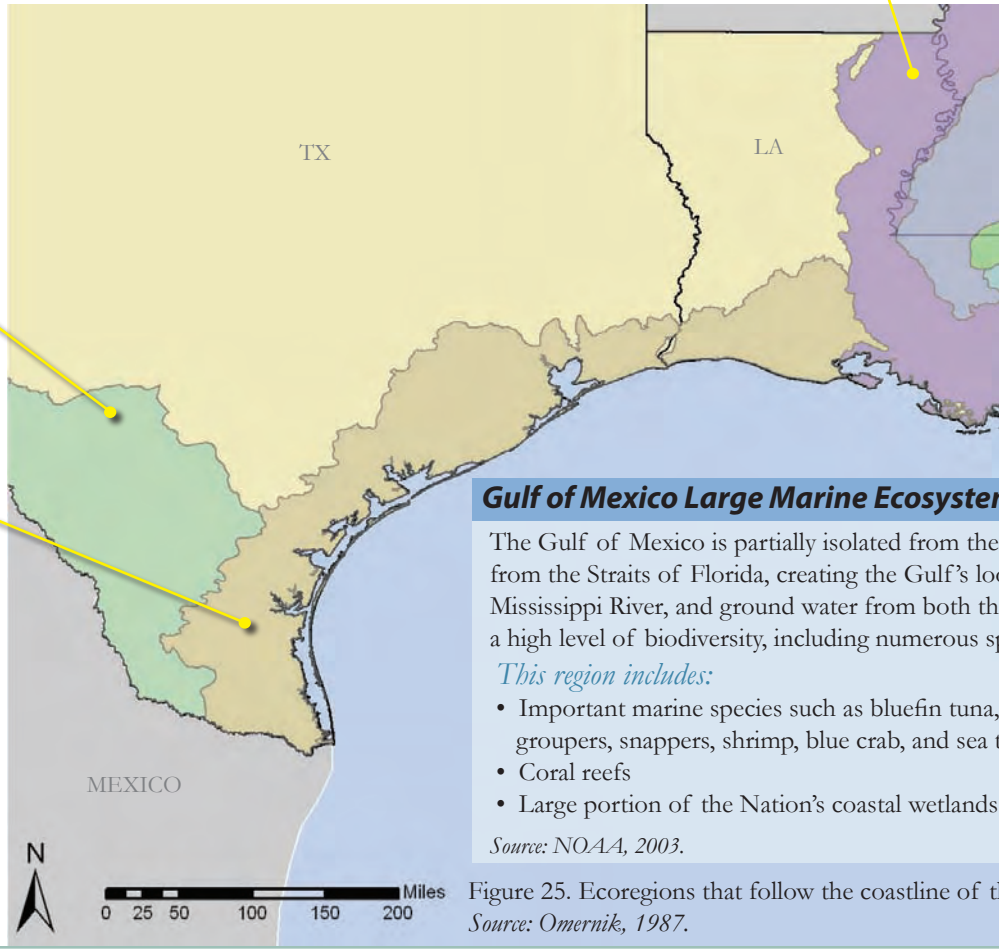
- Vital leg of a migratory bird flyway
- Threatened species such as the Swainson's Warbler and Louisiana black bear

Threats to this region:

- Hydrologic alterations to the region's streams and rivers
- Heavy fertilizer, insecticide, and herbicide use
- Logging of small remaining bottomland forest

Source: Daigle et al., 2006; World Wildlife Fund, 2001a.

Credit: Michael Maples, U.S. Army Corps of Engineers



Gulf of Mexico Large Marine Ecosyster

The Gulf of Mexico is partially isolated from the from the Straits of Florida, creating the Gulf's lo Mississippi River, and ground water from both th a high level of biodiversity, including numerous s

This region includes:

- Important marine species such as bluefin tuna, groupers, snappers, shrimp, blue crab, and sea t
- Coral reefs
- Large portion of the Nation's coastal wetlands

Source: NOAA, 2003.

Figure 25. Ecoregions that follow the coastline of t
Source: Omernik, 1987.

Mississippi Valley Loess Plains

This region is characterized by its thick loess deposits (wind deposited silt). Its landscape includes irregular plains, gently rolling hills, and bluffs near the Mississippi River.

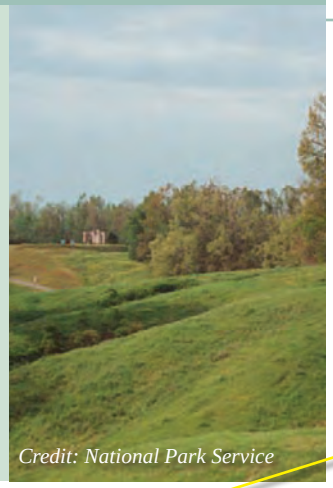
This region includes:

- Agriculture in the north
- Forest and cropland mosaic in the south
- Oak-hickory and southern mesophytic forests

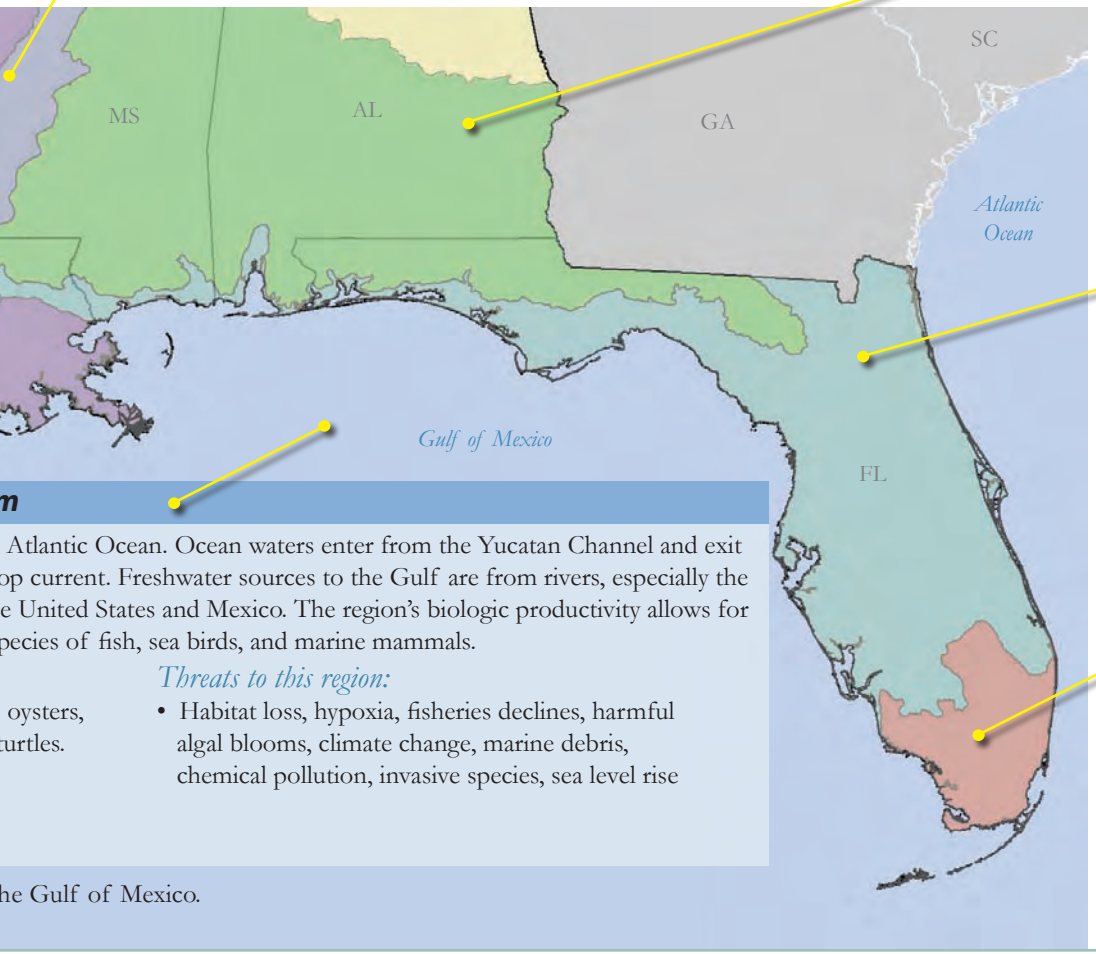
Threats to this region:

- Hydrologic alterations to the region's streams and rivers
- Heavy fertilizer, insecticide, and herbicide use

Source: Chapman et al., 2004; World Wildlife Fund, 2001c.



Credit: National Park Service



m

Atlantic Ocean. Ocean waters enter from the Yucatan Channel and exit
op current. Freshwater sources to the Gulf are from rivers, especially the
e United States and Mexico. The region's biologic productivity allows for
pecies of fish, sea birds, and marine mammals.

oysters,
urtles.

Threats to this region:

- Habitat loss, hypoxia, fisheries declines, harmful algal blooms, climate change, marine debris, chemical pollution, invasive species, sea level rise

he Gulf of Mexico.

Southeastern Plains

This region is comprised of irregular plains that are a diverse mix of cropland, pasture, woodland, and forest. Urban uses are expanding and in some areas much of the land has been converted to agriculture.

This region includes:

- Native oak, hickory, pine, and Southern mixed forest
- Diversity of snail species, amphibians, reptiles, birds, butterflies, and mammals species

Threats to this region:

- Agricultural and urban development
- Logging and forest conversion to commercially viable pine
- Lack of fire management for appropriate fire regimes

Source: Griffith et al., 1994; NatureServe Explorer, 2007.

Credit: Environmental Protection Agency

Southern Coastal Plain

The coastal area of this region is distinguished by barrier islands, estuaries, and lagoons. Further inland there is flat topography with numerous forested wetlands and lakes. The region's land cover is pasture, urban development, and longleaf-slash pine forest, with hardwood forests in low-lying areas.

This region includes:

- Important species such as the Flatwoods Salamander and the endangered Pondberry (a rarely seen plant)

Threats to this region:

- Land conversion
- Runoff from agriculture and urban expansion

Source: Griffith et al., 1994; NatureServe Explorer, 2007.

Credit: Mississippi Department of Marine Resources

Southern Florida Coastal Plain

A unique characteristic of this region is its frost-free climate, making it unique in the continental United States. This region is characterized by flat plains with wetlands where the vegetation is primarily everglade and palmetto prairie.

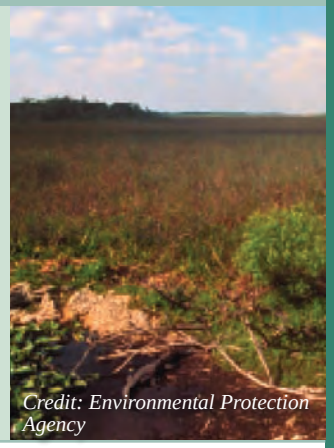
This region includes:

- Everglades and palmetto prairie vegetation
- Several parks, game refuges, and Indian reservations

Threats to this region:

- Hydrological and biological alterations
- Urban and agricultural expansion

Source: Griffith et al., 1994.



Credit: Environmental Protection Agency

Gulf Ecology

Hypoxia in the Gulf of Mexico

There are numerous threats to the Gulf of Mexico marine ecosystem, including the world's second largest human-caused zone of hypoxia. This hypoxic area, commonly referred to as the "Dead Zone," illustrates of the enormity and complexity of the threats facing the region's ecology and economy.

What is Hypoxia?

Hypoxia refers to depleted concentrations of dissolved oxygen in the water column, so depleted that fish and shellfish might not have enough oxygen to survive. Hypoxia can occur naturally; however, it often indicates a human-caused oversupply of nutrients – specifically nitrogen and phosphorus – from both urban and agricultural sources. This oversupply of nutrients in the water, a state called eutrophication, can cause intensive growth of plants and phytoplankton, or single-celled algae. When this bloom of plants and phytoplankton dies, they sink to the ocean bottom and decompose, a process which consumes dissolved oxygen.

Gulf Hypoxia and the Mississippi Valley Watershed

The Mississippi River begins below Lake Itasca in northern Minnesota, and flows approximately 2,350 miles to the Gulf of Mexico. On this journey, the Mississippi River captures runoff from 41% of the continental United States, making it the largest watershed in North America. Human activities have greatly altered the Mississippi River and its watershed; as a result, the river delivers substantial amounts of sediment, nutrients, and chemical pollutants to the Gulf of Mexico.

Since the 1970s, scientists have documented a large area of hypoxia off the coast of Louisiana and Texas. This "Dead Zone" forms annually in late spring, reaching its greatest extent in midsummer, and ebbing in the fall. Since 1985, it has fluctuated between 8,500 and 15,000 square miles in size, forming in the middle of a nationally important commercial and recreational fishing area.

Figure 26. The Mississippi River watershed and location of the hypoxic zone in the Gulf of Mexico.
Source: U.S. Geological Survey, 2004.

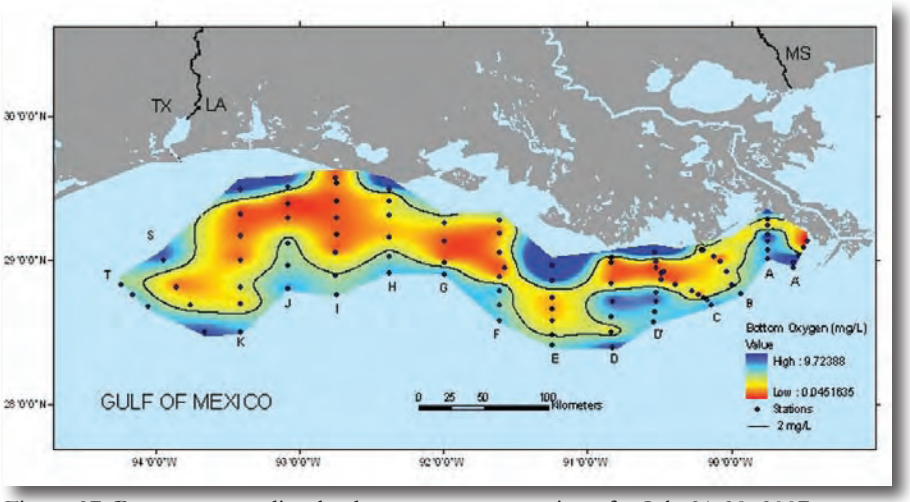


Figure 27. Bottom-water dissolved oxygen concentrations for July 21-28, 2007.
Source: NOAA/A. Sapp, Louisiana Universities Marine Consortium.

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Tara Montgomery
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Susan Hassett
Lynn Martin

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Charles Colgan

End Notes

[1] The shoreline miles presented in the Introduction were developed using the mean high water line digitized from NOAA's nautical charts at 1:80,000 scale.

[2] Coastal counties within the Southeast, Pacific, and Northeast Coast Regions were determined using the same criteria as explained in the Geography section of the Introduction.

[3] Hydrologic units are classified at four levels: regions, sub-regions, accounting units, and cataloging units. Cataloging units are the smallest hydrologic unit in this hierarchy (U.S. Geological Survey, 1987). There are 2,150 cataloging units in the United States, with an average 703 square miles (Virginia Department of Conservation and Recreation, 2004).

[4] Seasonal homes is one of six data elements collected by the U.S. Census Bureau as part of the vacancy status of housing units. The seasonal homes data element excludes the following: vacant housing units for rent, for sale, rented or sold (not occupied), or for migrant workers (U.S. Census Bureau, 2000).

[5] The Coastal Vulnerbility Index of Low, Moderate, High, and Very High categories is determined using six physical variables: geomorphology, coastal slope, rate of relative sea-level rise, shoreline erosion and accretion rates, mean tidal range, and mean wave height. All variables are assigned a relative risk value based on the potential magnitude of its contribution to physical changes on the coast as sea level rises (Thieler and Hammar-Klose, 2006). For further infomation, visit: http://pubs.usgs.gov/of/2000/of00-179/.

[6] A beach day is defined as a person-day of use as one person doing an activity for a whole day or any part of a day (Leeworthy and Wiley, 2001).

[7] The ecoregions listed and described in the Ecoregions and Threats chapter are those that follow the coastline of the Gulf of Mexico. Three additional regions, the East Central Texas Plains Ecoregion, the Texas Blackland Prairie Ecoregion, and the South Central Plains Ecoregion intersect with the Gulf Coast Region's coastal counties, but are not described in this report. For further information on these ecoregions, visit: http://www.epa.gov/wed/pages/ecoregions/level_iv.htm.

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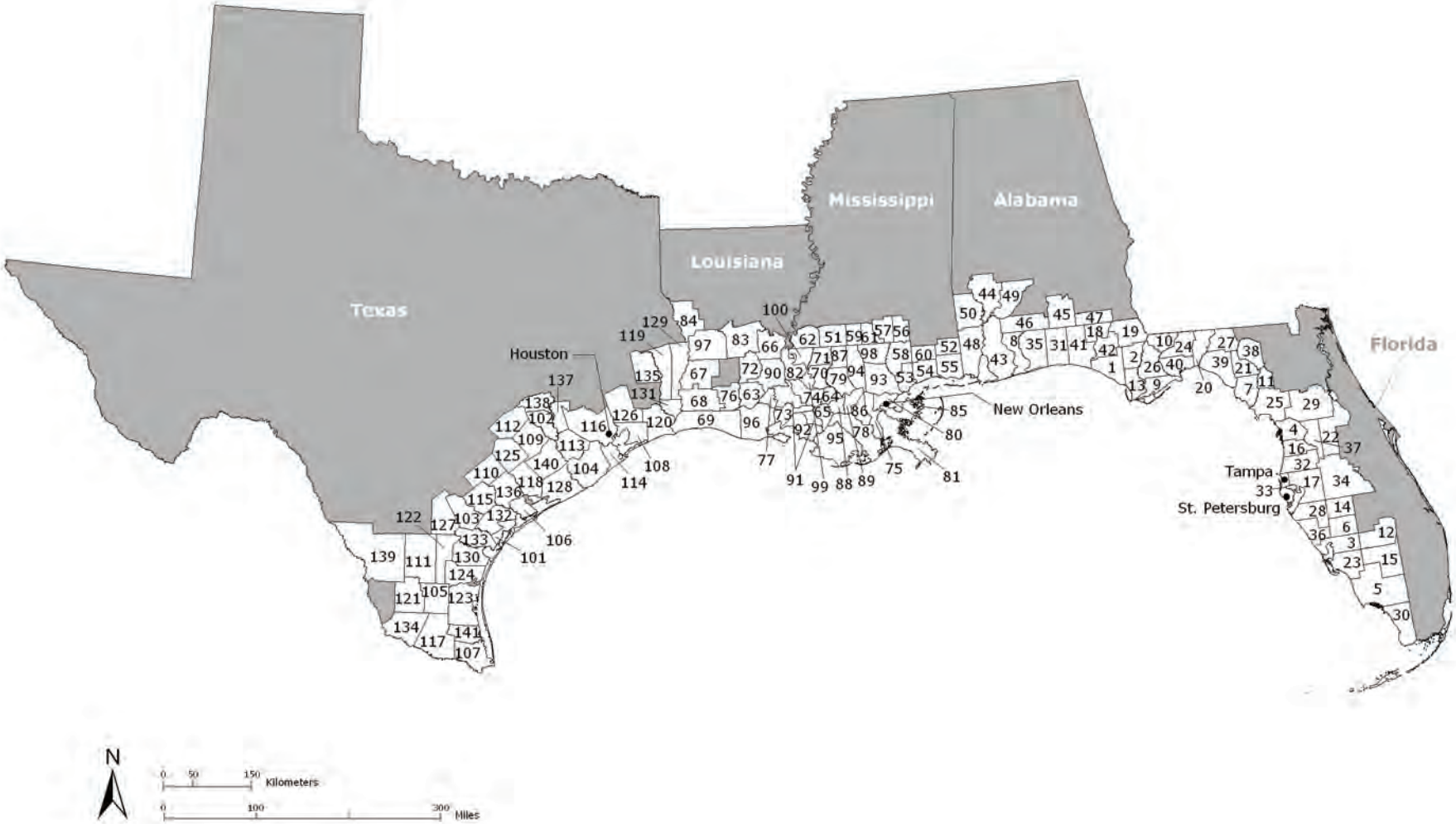
Appendix

The Gulf Coast Region



Gulf of Mexico Coastal Counties

Florida

1 Bay
2 Calhoun
3 Charlotte
4 Citrus
5 Collier
6 DeSoto
7 Dixie
8 Escambia
9 Franklin
10 Gadsden
11 Gilchrist
12 Glades
13 Gulf
14 Hardee
15 Hendry
16 Hernando
17 Hillsborough
18 Holmes
19 Jackson
20 Jefferson
21 Lafayette
22 Lake
23 Lee
24 Leon
25 Levy
26 Liberty
27 Madison
28 Manatee
29 Marion
30 Monroe
31 Okaloosa
32 Pasco
33 Pinellas
34 Polk
35 Santa Rosa
36 Sarasota
37 Sumter
38 Suwannee
39 Taylor
40 Wakulla
41 Walton
42 Washington

Alabama

43 Baldwin
44 Clarke
45 Covington
46 Escambia
47 Geneva
48 Mobile
49 Monroe
50 Washington

Mississippi

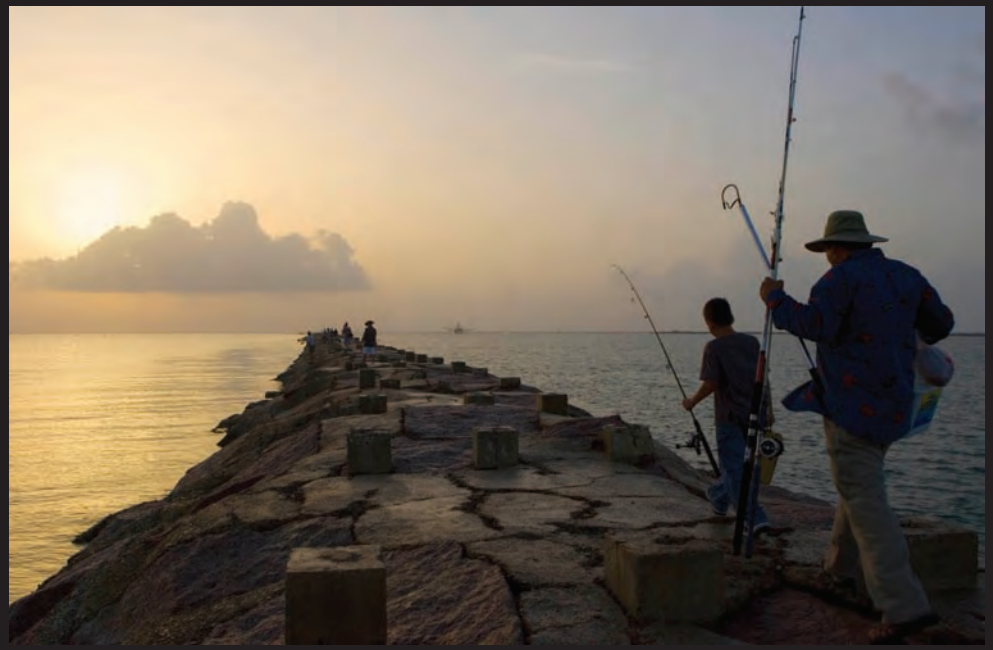
51 Amite
52 George
53 Hancock
54 Harrison
55 Jackson
56 Lamar
57 Marion
58 Pearl River
59 Pike
60 Stone
61 Walthall
62 Wilkinson

Louisiana

63 Acadia
64 Ascension
65 Assumption
66 Avoyelles
67 Beauregard
68 Calcasieu
69 Cameron
70 East Baton Rouge
71 East Feliciana
72 Evangeline
73 Iberia
74 Iberville
75 Jefferson
76 Jefferson Davis
77 Lafayette
78 Lafourche
79 Livingston
80 Orleans
81 Plaquemines
82 Point Coupee
83 Rapides
84 Sabine
85 St. Bernard
86 St. Charles
87 St. Helena
88 St. James
89 St. John the Baptist
90 St. Landry
91 St. Martin
92 St. Mary
93 St. Tammany
94 Tangipahoa
95 Terrebonne
96 Vermilion
97 Vernon
98 Washington
99 West Baton Rouge
100 West Feliciana

Texas

101 Aransas
102 Austin
103 Bee
104 Brazoria
105 Brooks
106 Calhoun
107 Cameron
108 Chambers
109 Colorado
110 DeWitt
111 Duval
112 Fayette
113 Fort Bend
114 Galveston
115 Goliad
116 Harris
117 Hidalgo
118 Jackson
119 Jasper
120 Jefferson
121 Jim Hogg
122 Jim Wells
123 Kenedy
124 Kleberg
125 Lavaca
126 Liberty
127 Live Oak
128 Matagorda
129 Newton
130 Nueces
131 Orange
132 Refugio
133 San Patricio
134 Starr
135 Tyler
136 Victoria
137 Waller
138 Washington
139 Webb
140 Wharton
141 Wilacy



The Gulf of Mexico Alliance is a partnership among the states of Alabama, Florida, Louisiana, Mississippi, and Texas, with the goal of significantly increasing regional collaboration to enhance the environmental and economic health of the Gulf of Mexico.

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