Rebuilding a resilient and sustainable Gulf Coast

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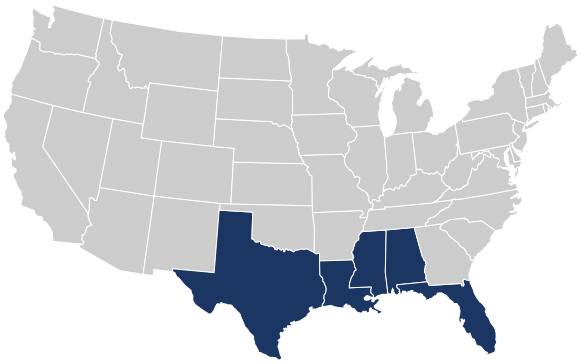

Unlike the Atlantic Coast, which has so far been closed to offshore oil drilling, America's Gulf Coast is one of the country's most productive oil-generating regions and has been for generations. If the American Petroleum Institute gets its way, the long-term strategy for the region is simply this: Drill more, including areas in the eastern Gulf, even though that area is off-limits to drilling to protect Florida's tourism and recreation industries. But it's not that simple. To remain economically vibrant, diverse, and resilient to frequent extreme weather events and the consequences of oil and gas and other development, the coastline, estuaries, and wetlands that define the Gulf Coast must be repaired and restored. Doing so is vital to the health and safety of the region and offers a tremendous economic development opportunity.

The recent history of America's Gulf Coast region includes two major disasters: Hurricane Katrina in 2005 and the BP Deepwater Horizon oil spill in 2010, highlighting anew the rich, complicated relationship between the natural resources and economy of the region. The Gulf of Mexico is a powerful economic engine, driving not just oil and gas development but also industries such as transportation, food production, and tourism for the region and the entire nation. The Mississippi River and its delta, the Gulf's many ports, the beautiful shores and beaches, and the region's world-class fisheries promote billions of dollars in economic activity annually. For instance:

- Tourism and recreation provide more than 620,000 jobs along the Gulf Coast, about 8 percent of total jobs. Along the Mississippi coast, it accounts for one in five jobs.[45]

- Hosting 13 of the nation's 20 largest ports by tonnage, the region transports 50 percent of the nation's international trade, including much of our food exports. This accounts for one in seven jobs statewide in Louisiana.[46]

- More than 23 million recreational fishing trips are taken annually in the region, more than 30 percent of the U.S. total.[47] This accounts for $41 billion in economic activity annually supporting more than 300,000 jobs.[48]

- More than 30 percent of the nation's seafood—1.3 billion pounds annually, including more than 70 percent of our nation's shrimp and oysters—are harvested in the Gulf.[49]

The Gulf of Mexico also provides thousands of jobs in the oil and gas industry. Generations of workers primarily in the Central Gulf (from Alabama to Texas) have found work in offshore oil and gas production, going back to the 1940s, when Cajun fishers used shrimp boats to supply Texan oil men building the offshore industry beginning in southern Louisiana. More than 120,000 jobs in the Gulf Coast region and $12 billion in wages are linked to petroleum-related activities, which make up 1.4 percent of the region's total employment, according to the Bureau of Labor Statistics.[50]

Value of coastal industries in the Gulf region

Healthy coastal ecosystems are major economic drivers

Industry	Jobs	Economic activity
Tourism/recreation	620,000	$94 billion
Recreational fishing	300,000	$41 billion
Commercial fishing and seafood	213,272	$10.5 billion

Source: U.S. Travel Association; National Marine Fisheries Service

The vast majority of this activity is off the coast of Louisiana and Texas. This is because Florida primarily rejected offshore development over fear that it would harm the state's $67 billion coastal tourism and $13 billion outdoor recreation annual markets.[51]

Most of the region's oil production today—about 80 percent—occurs in offshore wells constructed in what is classified as deepwater (between 1,000 feet and 4,999 feet) or ultra deepwater (more than 5,000 feet), with drilling depths reaching as deep as 6.5 miles.[52] As was evidenced all too painfully by the 2010 Deepwater Horizon oil spill, these activities come with significant economic and environmental risks and, when disaster strikes, can adversely affect the region's other core industries, among them fisheries, recreation, and tourism.[53]

The explosion aboard the Deepwater Horizon oil rig killed 11 workers and spewed 4.9 million barrels of oil into the Gulf of Mexico. More than 1,050 miles of shoreline were fouled with oil, and as many as 200 miles, mainly marshes where cleanup is not feasible, remain covered in oil.[54] Fishermen reported unsettling changes in some areas, ranging from lower-than-average shrimp catches to the complete collapse of oyster beds.[55] Reports of disfigurements such as shrimp with no eyes and crabs born with oil in their shells only added to the concern. Initial research shows certain populations of fin and shellfish in key estuaries reacting poorly to oil and chemical dispersants used to break up spilled oil.[56]

In addition, the oil is accelerating the destruction of certain wetlands, a key nursery for important species.[57] Already many fishermen are experiencing losses and underemployment. A new study says that over seven years, this oil spill could cost an additional $8.7 billion in losses in the fishing economy of the Gulf of Mexico, including the loss of close to 22,000 jobs.[58] While the full economic impact will not be known for several years, the oil company responsible for the catastrophe—BP plc—has paid out more than $7 billion in economic damage claims to workers and business owners so far.[59]

The inherent volatility of fossil fuel extraction—combined with the increased risks of deepwater drilling—certainly highlight the need to evaluate the full scale of future drilling strategies in the region and also point to the importance of diversifying the region's economic base in case of future disaster.[60] Indeed, the BP oil spill struck when the region's ecosystem was already in trouble. In recent years, the health of the Gulf of Mexico and its bays and tributary rivers have declined precipitously, jeopardizing the many valuable assets and livelihoods the Gulf provides. Already lost are up to 50 percent of the region's inland and coastal wetlands, 60 percent of its sea grass beds, more than 50 percent of oyster reefs, and almost a third of its mangrove forests.[61]

In Louisiana a football field of land in the Mississippi River Delta disappears into the Gulf every hour.[62] By 2050 one-third of coastal Louisiana will have vanished into the Gulf of Mexico. Similarly, since the mid-1900s nearly 2,000 square miles of fish nurseries, shrimping grounds, recreational paradise, and communities have been lost.[63] This has huge implications for the region's economy and its communities. At least 97 percent (by weight) of the commercial fish and shellfish landings from the Gulf of Mexico are species that depend on estuaries and their wetlands, especially in the Mississippi River Delta, at some point in their life cycle.[64]

There are two main historic sources for all this erosion: construction of the Mississippi River's levee system and development by the oil and gas industry.[65] Starting in the 1880s the U.S. Army Corps of Engineers began constructing levees up and down the Mississippi River to provide flood protection to communities and farms through the heart of the nation's breadbasket. But the levees impaired the ability of the river to carry and distribute sediment into the river's delta and to sustain land in southern Louisiana. In the early to mid-20th century, the oil and gas industry dredged thousands of miles of canals and pipelines through the Delta to carry its products to market without regard to the importance of the marsh.[66] In Louisiana, according to one study, between 40 percent and 60 percent of the total wetland loss between 1932 and 1990 in the Mississippi River Delta Basin can be directly attributed to oil and gas operations.[67]

These activities have also contributed to subsidence—meaning that land is actually sinking—which compounds land loss. Mississippi, Alabama, Florida, and Texas are also experiencing shoreline and marshland loss.

These factors are all compounded by climate change and a relative sea level that is forecast to rise by between 5 inches and 6 inches by 2030 and by between 2.5 feet and 5 feet by 2100. When added with the predictions of stronger winds, hotter water temperatures in the Gulf of Mexico, and a greater impact from hurricane storm surge, such change could significantly strengthen extreme weather in the region—to the tune of $13.2 billion in additional annual climate-related damage.[68]

The consequences of wetland erosion and the benefits of protection and preservation

The rapid loss of wetlands has serious implications for the resiliency of the Gulf Coast's economy and environment. Wetlands provide multiple critical ecosystem services such as filtering hazardous manmade pollutants, including pesticides, metals, and fertilizers. Each acre does $35,000 to $150,000 of work done in a comparable water treatment plant.[69] This improved water quality reduces costs for homeowners and businesses, and improves real estate values.

Healthy wetlands, barrier islands, and oyster reefs also protect homes and businesses by reducing the impacts of storm surge, flooding, and sea-level rise. Over the next 20 years, according to a recent study by the regional utility company Entergy Corp., the Gulf region faces $350 billion in economic damages from

hurricanes, flooding, and sea-level rise, and the severity of these extreme weather events will only be exacerbated by climate change.[70]

Investing in coastal restoration can help mitigate these risks. Even the region's oil and gas industry—particularly its production, refining, and transportation infrastructure located along the coast—faces risks as a consequence of these ecological changes. According to America's Energy Coast, a regional coalition of oil and gas, conservation, and other interests:

> *Environmental threats—intense storm events, sea level rise, subsidence, and coastal erosion—put our ability to sustain [oil and gas] infrastructure in jeopardy, compromising pipeline integrity and posing a significant national security threat.*[71]

These risks highlight why fossil fuel producers such as Chevron Corp., the Royal Dutch Shell Group, and the American Petroleum Institute actually support state and federal investments in coastal restoration.

Wetlands not only help the region stay resilient in the face of damage from climate change but also are one of the best ways to mitigate that damage. Wetlands are the largest global carbon sinks, meaning that they store carbon so that it is not released into the atmosphere. Worldwide, these areas comprise just 4 percent of all land but hold almost 33 percent of the world's organic matter. Wetlands are anaerobic (low- to zero-oxygen) environments, and thus good for carbon storage.[72]

As such, wetlands are potentially a moneymaker in a carbon-constrained economy, especially if the United States ever imposes a price on carbon. A New Orleans-based firm, Tierra Resources, LLC, already boasts a methodology with the American Carbon Registry to finance coastal wetland restoration through carbon offset purchases. The firm found that each restored acre of wetlands generates between 5 tons to 40 tons of carbon sequestration per acre per year for decades. Planting trees, by comparison, generates about 5 tons to 7 tons.

While carbon offsets in the United States represent a largely voluntary market to date, California's carbon cap-and-trade program will become the world's second-largest regulated carbon market in 2013 and may open up a new substantial market for Gulf Coast wetland restoration carbon offsets. Future federal climate change policy could also open additional opportunities to finance coastal restoration through carbon offset programs.

In addition to pressing environmental concerns, the region is in desperate need of new industries and job opportunities. Alabama, Florida, Louisiana, Mississippi, and Texas rank among the worst states in the country for economic mobility and poverty.[73] While some areas of the coast are home to relative wealth, small fishing communities such as Dulac, Louisiana, Apalachicola, Florida, Bayou La Batre, Alabama, Point au La Hatche, Louisiana, and Pascagoula, Mississippi face double to triple the national poverty rates. These communities have always been places of limited means and have faced greater risk of disaster due to social vulnerability. A healthy Gulf put a roof over the heads of and food on the table for many low-income families for generations. But now, after Hurricane Katrina and the BP oil spill, small multigenerational family fishing and seafood enterprises are under threat.[74]

The restoration economy may offer a way into a new set of industries and jobs for many of these families. Oxfam America conducted focus groups with coastal restoration businesses to identify career opportunities in coastal projects. The study found occupations such as boat captains, welders, fitters, and deckhands offered high-demand middle-skilled jobs that paid above median wages, where fishers had some transferable skills, with some training and on-the-job experience.[75] Funding job training and placement programs could be a way to help underemployed fishers find new careers in the restoration economy. In addition, industry leaders note these jobs can also be a good source of upward economic mobility.[76]

Adding to the economic benefits of large-scale investment in coastal restoration is the long-term potential to develop regional economy hubs that create jobs and generate economic activity across a variety of sectors. The design, construction, operation, and monitoring of large-scale coastal and marine restoration projects represents a growing business whose impact ripples throughout the region's economy. Contractors and subcontractors on restoration projects directly employ workers in the planning, construction, operations, and monitoring of projects. This, in turn, creates demand for manufacturing, growing, and maintaining supplies and equipment (boats, dredges, earthmoving equipment, plants) that are critical to constructing restoration projects and also that utilize local services such as fuel, lodging, and food-service providers. Additionally, the workers hired for the projects make purchases and reinvest in their local economies.

Studies find that each $1 million in investment in ecosystem restoration can create as many as 36 jobs in design, construction, and operations.[77] Much more so than in the oil and gas sector, the restoration sector includes jobs across a huge range of occupations and skill levels, including:

- Low-skill jobs such as laborers and nursery workers
- Middle-skill jobs such as U.S. Coast Guard-certified captains, heavy-equipment operators, welders, fitters, and engineering technicians
- High-skill jobs such as environmental and civil engineers, hydrologists, and biologists

Many of these jobs require skills similar to those used in the traditional oil and gas, as well as transportation, industries, meaning the region already has a trained workforce base that can transition into restoration occupations.[78]

South Florida's Everglades, where the nation's largest ecological restoration is underway, provides an example of the economic power of reversing decades of degradation. The first $1.5 billion in construction was projected by the Army Corps of Engineers to create 22,000 jobs.[79] Projections show that investing $11.5 billion in a comprehensive Everglades restoration could result in $46.5 billion in gains to Florida's economy and create more than 440,000 jobs over the next 50 years, thanks to improvements in water quality, fishing, recreation, hunting, and park visitation, according to a report by Mather Economics, LLC. For every $1 invested in Everglades restoration, $4 is generated in economic benefits.[80]

Job creation per $1 million investment

Coastal restoration projects generate significant local employment

Energy infrastructure projects	16.8
Transportation infrastructure projects	18.9
ARRA coastal restoration projects	17
ARRA labor-intensive coastal restoration projects	33
The Nature Conservancy coastal restoration projects	36

*Job creation varies depending on specific project.

Source: Natural Oceanic and Atmospheric Administration, The Nature Conservancy, and Political Economy Research Institute.

Louisiana also recognizes the need to invest in coastal restoration. In early 2012 the state released its Coastal Master Plan, a $50 billion 50-year plan for restoring Louisiana's coastal wetlands and protecting coastal communities. The plan included a range of projects such as restoring barrier islands, headlands, and shorelines as first lines of defense against storms. In addition to the recreational and commercial value of restoring these resources, the projects will reduce future risk from storms and flooding for coastal homes and businesses by as much as $18 billion annually.[81] This includes a $20 billion investment in sediment mining and marsh creation projects—the nation's largest commitment to such activities, which has already helped to spur new investments by the dredging industry.[82] State officials hope fines and damages from the BP oil spill, including resources from the recently passed RESTORE the Gulf Coast Act, will begin to pay for this plan, though its completion will require additional federal and state resources.

These projects will be a source of job creation in the state well into the future. Already 1 out of every 14 construction jobs in the state is linked to coastal restora-

tion, according to the Louisiana Workforce Commission, and this number will likely climb in years to come.[83] Thanks to new legislation—the Louisiana First Hiring Act—the state is making new efforts to help local workers connect with contractors and find new career opportunities in the restoration economy by requiring firms to report available jobs at local workforce agencies.

The scale of the region's ecological challenges offers an exciting opportunity for business in the Gulf to turn those challenges into new economic markets. National and international leaders in heavy construction and engineering—Atkins North America, HDR, Inc., Arcadis US Inc., CH2M Hill, Bechtel Corporation, and Odebrecht S.A.—have been drawn to the Gulf Coast region. Many firms in more traditional sectors such as oil and gas services and navigation—among them the Shaw Group Inc. (now owned by Chicago Iron and Bridge Co.), Thompson Engineering Inc., Orion Marine Group, Inc., Cajun Industries, LLC, and CF Bean, LLC—have diversified their work to apply decades of experience in design and construction in the coastal and offshore environment to new lines of business tackling ecological problems.

A Duke University study of restoration projects found a stunning 67 percent of firms with such expertise and experience are located in Texas, Louisiana, Mississippi, Alabama, and Florida.[84] According to the Duke survey, another 67 percent of firms in the sector are small businesses.[85] Given small businesses' contribution to creating jobs and the struggles of small and medium-sized businesses in the economic downturn, restoration work could provide a new way to retain or grow these vital enterprises.[86] For most of the firms in the study, restoration makes up less than a quarter of their work. Oil and gas services, civil construction, and transportation are still many of these businesses' primary lines of work, but restoration represents a new market for these products and services that could grow with additional public investments in projects.

The Gulf is also home to more than 330 research laboratories, organizations, and programs working on coastal and marine sciences.[87] Building upon decades of research and collaboration, universities and colleges in the region generally work together on research projects informally in an effort to find the best techniques for permanent coastal repair and conservation. New initiatives—among them the Water Institute of the Gulf in Baton Rouge, Louisiana, and the National Oceans and Applications Research Center in Hancock County, Mississippi—will only build on this expertise.

The way forward

With so many businesses engaged in restoration and a growing set of research institutions tackling water management challenges, the region is truly emerging as a center of excellence in restoration innovation and jobs. State and local economic development agencies have taken note, launching new initiatives to support the restoration economy and further build community resilience. Realizing that many of its core industries saw slowing growth potential, Louisiana Economic Development—the state's economic development agency—set out to find new high-growth markets to diversify into building on existing strengths. Water management, including coastal restoration, was found to be one of the state's top options. A study by the consulting firm McKinsey & Co., estimates that $3 billion to $4 billion per year by 2029 will be spent in the state in water management, generating and sustaining as many as 45,000 new jobs. This will provide new markets for businesses in the state, helping to diversify its industrial base.[88]

Coastal restoration is not only a need along the Gulf Coast. According to the global reinsurance company Swiss Re, by 2030 the world will spend anywhere between $35 billion and $135 billion a year on coastal flood defense, flood-resistant buildings, and other adaptations.[89] With new markets in Asia and elsewhere developing coastal management plans that include restoration and green infrastructure activities, this could create a new export industry for the Gulf Coast.[90]

Federal and state policy will have a big influence on the Gulf Coast's emerging restoration economy and the implementation of restoration projects, particularly those funded by fines from the Deepwater Horizon oil spill. The so-called Natural Resource Damage Assessment of the spill requires responsible parties to restore natural resources lost as a result of the disaster, which could fund billions of dollars in restoration projects. In addition, Congress passed the RESTORE the Gulf Coast States Act on June 29, 2012, which guarantees 80 percent of Clean Water Act fines paid by the responsible parties will be dedicated to economic and environmental restoration projects in the affected states.

It is crucial that the Department of Justice and state and federal trustee agencies hold the responsible parties fully accountable for the consequences of this tragedy on the region, its resources, and its working families. Once funds are in hand, which could still be years away, priority should be given to projects that create socioeconomic benefits by maximizing job training and contracting opportunities for local workers and businesses and by ensuring that projects create ecosystem service benefits

for the economically and socially vulnerable communities that depend most on the region's natural resources for flood protection and their livelihoods.

The bright potential for the development of a thriving coastal restoration economy—one that creates jobs and spurs research and innovation, while simultaneously addressing the urgent need to restore the region's natural resources and curb carbon emissions—is proof that the Gulf coast does not need to remain solely reliant on oil and gas. There are options for diversifying beyond fossil fuels and improving the region's ecological, social and economic resiliency.

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