



THE SCHOOL OF BIG STORMS

The High Cost of Compromising
Our Natural Defenses and the
Benefits of Protecting Them



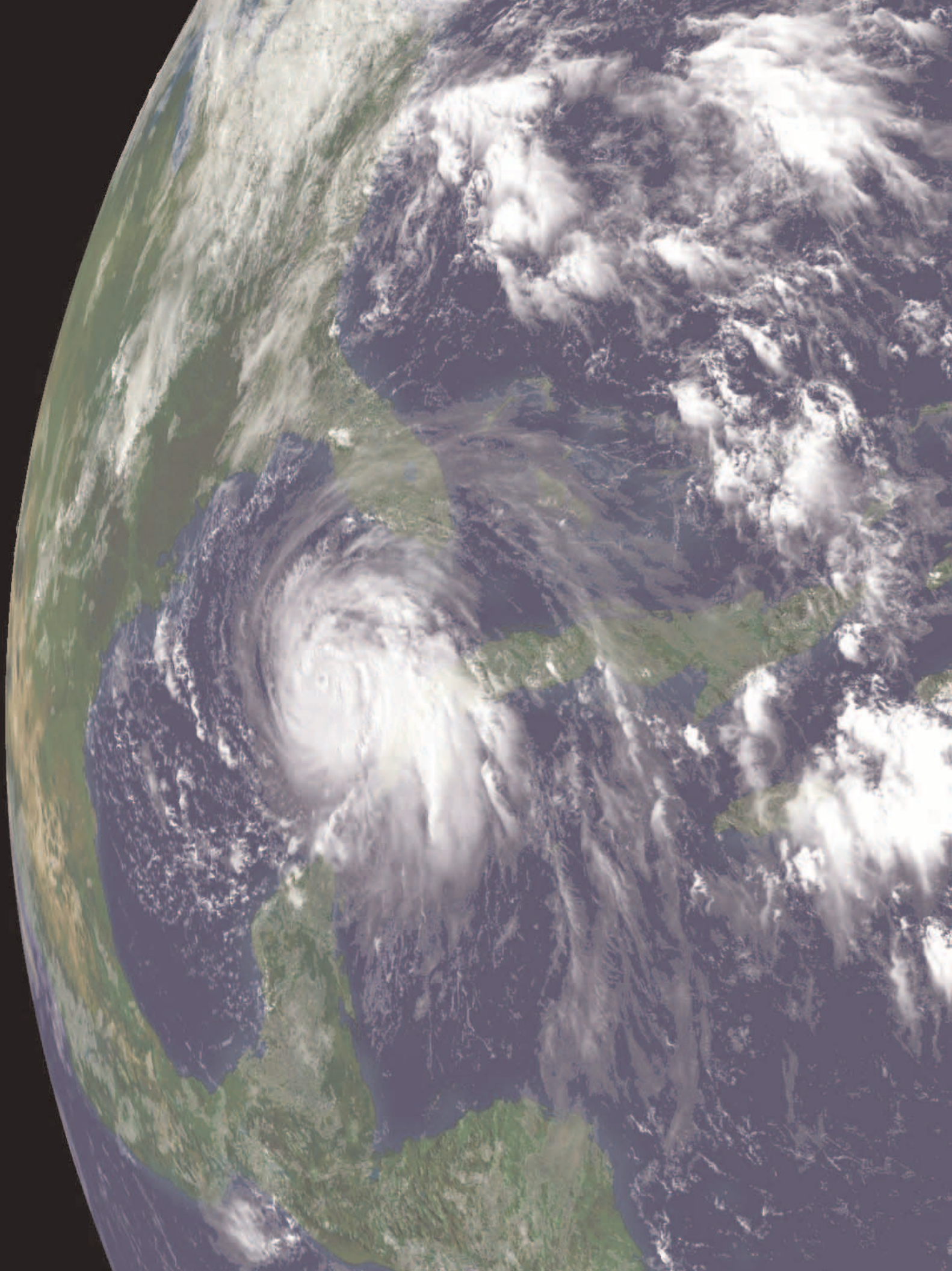


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This report is a joint effort between the Gulf Restoration Network and the Sierra Club.

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The Gulf Restoration Network (GRN) is a diverse network of individuals and local, regional and national groups committed to uniting and empowering people to protect and restore the resources of the Gulf region. Founded in 1994, we have members in each of the five Gulf states. The GRN plays a pivotal role in providing our members with the technical assistance, Gulf-wide strategic collaboration, and campaign support needed to successfully address environmental threats in their communities.

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The Sierra Club's 800,000 members work together to protect communities and the planet. The Club is America's oldest, largest and most influential grassroots environmental organization.

We would like to thank the contributors to the rebuilding efforts of the '**Sierra Club Gulf Coast Environmental Restoration Project and Task Force**' for making this work possible.

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EXECUTIVE SUMMARY

What Lessons Have We Learned?

With the devastating back-to-back hurricane seasons of 2004 and 2005 — including Hurricane Katrina, the most destructive hurricane on record — people around the world are coming to an understanding about life on the coast of the Gulf of Mexico. Hurricanes are a fact of life. We cannot avoid them and we cannot forecast exactly when and where they will strike. Furthermore, the National Weather Service predicts that we have entered a prolonged period of increased hurricane frequency and intensity in the Gulf of Mexico. Our communities need to be better prepared to withstand and survive hurricanes than ever before.

The Gulf Restoration Network and the Sierra Club have taken a look at communities across the Gulf to see what they have been doing to strengthen or weaken their protection from storms. We wanted to find out: What lessons have we learned? Have we made our communities safer and better able to withstand storms over time? If not, what needs to be done to ensure our safety?

We discovered that in most cases, we have yet to learn the necessary elements for a safe and secure Gulf coast. Much of the devastation from recent hurricanes could have been lessened if we had learned the lessons outlined here sooner. Now we hope to avoid continuing to make the same mistakes that put our communities at greater and greater risk. If we allow the

Hurricane Katrina flood damage in the Lakeview neighborhood, New Orleans, LA



L. March



Photodisc

continued destruction of our natural barriers, such as coastal wetlands and barrier islands, then we take away nature's ability to reduce the strength and impact of hurricanes. We have seen that often when good plans or proposals are made to improve the protection of our communities, our elected officials fail to implement critical elements.

This report is not intended to serve as an exhaustive review of every coastal community's efforts; rather we believe that each example highlights a key lesson that should be learned by everyone. These case studies highlight the following lessons:

- Encouraging development in the flood plain or upriver from a flood-prone area only puts more people at risk.
- Developing plans to reduce flooding impact are only successful when they are not weakened as a result of political pressure.
- Protecting our barrier islands and coastal wetlands will protect our communities.
- Allowing navigational projects or development that destroys our natural storm barriers will only worsen the impacts from hurricanes.
- Encouraging development that is set back from the waterfront will protect our communities.
- Protecting the natural habitat for endangered species along the coast will also protect our communities.
- Exempting development from building codes or other storm protection requirements only weakens a community's defenses.
- Strengthening oil and gas critical infrastructure will help protect people and the environment.

These are lessons that need to be heeded by all of the communities in the Gulf. The lessons should guide elected officials, government agencies, and citizens living along the Gulf coast. If we can learn from these lessons that past hurricanes have taught us, we will not merely protect our natural coastal environment but also the people and communities that live here.



ENERGY AND THE GULF COAST

Critical Energy Infrastructure Must Withstand Category 5 Storms

LESSON: STRENGTHENING OIL AND GAS CRITICAL INFRASTRUCTURE WILL HELP PROTECT PEOPLE AND THE ENVIRONMENT.

Nature has suffered at the hands of the oil and gas industry in the Gulf Coast for many years. A large portion of our coastal wetland loss is attributed to the miles of pipelines and oil and gas exploration canals crossing the swamps along the Louisiana and Southeastern Texas coasts. Poor air quality and subsequent health problems plague refinery towns. Toxic chemicals including barite are used in drilling activities and remain in soil and water as hazardous waste. Extraction of oil and gas is thought to be partially responsible for continued subsidence in the region. Fish and wildlife have been impacted by the changes in the environment and by occasional oil spills.

These were our issues in the Gulf before we entered the current intense hurricane cycle. And now, the Gulf Coast must contend with yet another significant and lasting impact of oil and gas activity in our region. According to recent Mineral Management Service Reports, 113 platforms were destroyed by Hurricanes Katrina and Rita and 457 pipelines were damaged. There are up to 35,000 miles of pipelines in the Gulf. Many of the pipes are less than 10-inches in diameter, appearing like “spaghetti on the ocean floor.” It may take as long as five to seven years to repair all of the damage.

Not only did the storms shut down much of the oil industry in the Gulf, they also had a lasting effect on raising energy prices throughout the United States. Twenty-five percent of the nation’s oil industry shut down for weeks after the storms. The oil companies are scrambling to finish repairs before the next storm season starts. In the meantime, they are still looking for missing oil rigs that have become navigational hazards.

What lessons can we learn from this experience? We need to hold oil companies accountable for the

damage they have done and ensure that they assist in the restoration of our coastal wetlands. We need to recognize that shallow water drilling near islands and coasts can cause subsidence and future flooding. We must also demand that oil and gas companies have comprehensive plans for evacuation in the face of storms. Most importantly, oil and gas infrastructure must be moved from harm’s way when possible. Those platforms, rigs, and pipelines that cannot be moved must be redesigned and fortified to withstand category 5 storms.

Refineries in Wetlands

The Murphy oil spill in St. Bernard Parish, Louisiana is the best example of a lesson that we need to learn regarding building refineries in flood plains. As a result of Hurricane Katrina, a storage tank at the Murphy refinery was dislodged and spilled about 1.05 million gallons (25,110 barrels) of mixed crude oil into the surrounding neighborhood. The spill, according to the Centers for Disease Control, covered one square mile, though the extent is still being debated. The thick, goeoy

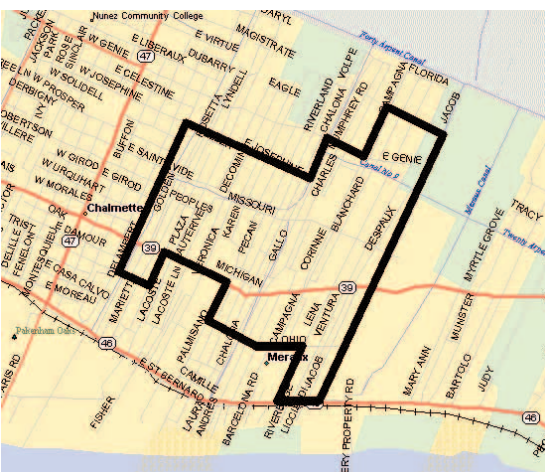


material flowed with the flood waters from a neighboring levee into people's homes. The Environmental Protection Agency (EPA) claims that most of the oil evaporated, but subsequent independent studies have indicated there are high levels of benzene in the sediment. "People

shouldn't even have been given an option to go back in," says Wilma Subra, an environmental chemist in New Iberia, La.

Standard procedure in the industry when faced with possible weather events is to top off the tanks so they won't tip over. Murphy Oil personnel did not put enough crude oil into the 250,000 barrel tank, leaving it close to 90% empty. The 18-foot storm surge from Katrina easily tipped the tank over.

The lesson from this case is that industrial developments need to have good hurricane response plans that involve getting the plant properly secured and shut down. Furthermore, building refineries in wetlands close to a residential area in a hurricane zone is not good planning. We must consider future consequences when siting new businesses. As communities rebuild, we need to make good social and economic decisions to ensure both prosperity *and* safety.





TEXAS

Protect lives and property by reducing development in the Floodplains.

LESSON: ENCOURAGING DEVELOPMENT IN THE FLOOD PLAIN OR UPRIVER FROM A FLOOD-PRONE AREA ONLY PUTS MORE PEOPLE AT RISK.

LESSON: DEVELOPING PLANS TO REDUCE FLOODING IMPACT ARE ONLY SUCCESSFUL WHEN THEY ARE NOT WEAKENED AS A RESULT OF POLITICAL PRESSURE.

On September 23rd, 2005, an entire city of two million took to any road that headed out of Houston, Texas. The next day Hurricane Rita made landfall and, although her storm surge was horrific for parts of the Texas-Louisiana border, Houston escaped with minor damage. There was a collective sigh of relief, especially from those who had experienced Tropical Storm Allison in 2001.

*Houston under water during
Tropical Storm Allison*

Tropical storm Allison dumped about 37 inches of rain over several days, flooding most of downtown Houston and spreading out through the area's bayous. The city's concrete ditches and underground sewer pipes that make up its storm retention system were overwhelmed. The storm caused over \$5 billion in damages, flooded 45,000 homes and killed 22 people, making it the most expensive tropical storm-related natural disaster in our nation's history. A National Oceanic and Atmospheric Agency's (NOAA) report produced after the storm noted that most deaths were due to people ignoring flash flood warnings.

One of the reasons that tropical storm Allison was such an expensive storm is that it flooded heavily-populated areas. The storm flooded the Texas Medical Center, including two medical schools and 13 hospitals, downtown tunnels that serve office buildings, low-income neighborhoods and public housing developments. Even Interstate 10 flooded, closing potential escape routes.

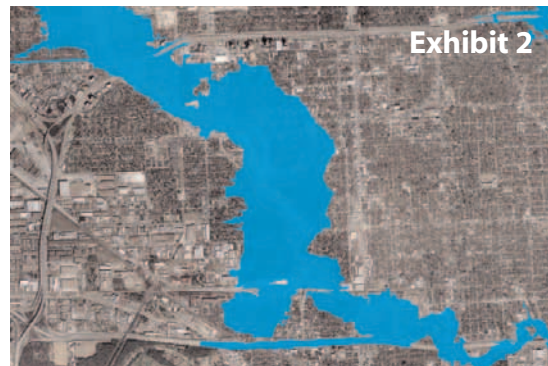
One of the culprits in the disaster is sprawl. Houston allows development on floodplains and sometimes even floodways. Juan Parras, a local



*National Weather Service Forecast office,
Houston TX*

environmental justice activist and Gulf Restoration Network Board Member, answers the question as to why development has occurred in these areas by saying, "Just because we [Houston residents] are 48 miles inland, people think Houston won't flood....but we do." Part of the reason Tropical Storm Allison was so expensive is because the city's planners failed to acknowledge that flooding and Houston are not strangers.

Houston was founded in 1836 at the confluence of the Buffalo and White Oak Bayous. According to local folklore, the original settlement flooded soon



As a result of the increased downstream flooding, the 100-year flood plain maps for White Oak Bayou were redrawn by the HCFC and Federal Emergency Management Agency. The change in the flood plain is shown in Exhibits 1 and 2. Exhibit 1 is dated 1996. Exhibit 2 is dated 2000.

after its founding. The settlers responded to the flooding by building channels to drain the water or to send it elsewhere. The channels were the first of many structural flood control projects. In 1937, the Harris County Flood Control District (HCFC) was formed to work with the Army Corps of Engineers in saving downtown Houston from annual flooding. Despite this effort, the Houston area continues to flood, with many houses having flooded more than once. Texas ranks second only to Louisiana in repetitive claims filed under the National Flood Insurance Plan.

As a result of Allison and other flooding events, the HCFC developed a plan to address the problems:

- There is now a regional planning body that determines strategies on how development takes place and how to keep it out of wetlands.
- The Flood Control district worked with FEMA to get updated flood maps that are more accurate than past maps.
- HCFC has a buy-back operation offering voluntary buyouts at full market value to homeowners within areas identified as high risk.
- HCFC has initiated a major campaign to convince homeowners to buy flood insurance whether they are in the 100-year floodplain or not.
- In an attempt to work with nature instead of against it, the HCFC has designed what they call “the new bayou.” They are designing new retention areas and channels that follow natural routes. These designs create a drainage system that uses less concrete and adds more green space to the city. The green space around the projects will be open to the public as parks.

Although this plan seems to be a step in the right direction, environmental and community activists believe there are problems with implementation. Jim Blackburn of the Galveston Bay Conservation and Protection Association thinks that buyouts have not been done as comprehensively as they should. “Sometimes the best insurance against flood damage is simply getting out of Nature’s way.”

Blackburn also points out that the HCFC itself was responsible for flooding on White Oak Bayou in downtown Houston. The HCFC flood control master plan included allowing new development in the upper portion of the watershed in exchange for payment of impact fees by developers. The money was to be used to construct channel improvements and regional retention ponds that were supposed to mitigate the impacts of upstream development on downstream flows. Despite the fact that the fees were collected, the HCFC never completed the entire project.

The result was extensive flooding on White Oak Bayou in 1998, 2001 and 2002. For the most part, these areas had not flooded prior to 1998. It is also important to note that a consultant to HCFC warned that flooding would happen if the full plan were not completed. “The flooding on White Oak Bayou was a man-made tragedy. If the plans had been implemented as authorized, this extensive flooding wouldn’t have happened.”

Urban areas throughout the Gulf should take note of the solutions that Houston has developed to address the threat of flooding and adopt and implement their own protective plans. Failure to implement flood management plans will jeopardize communities and potentially make the next disaster even worse.



LOUISIANA

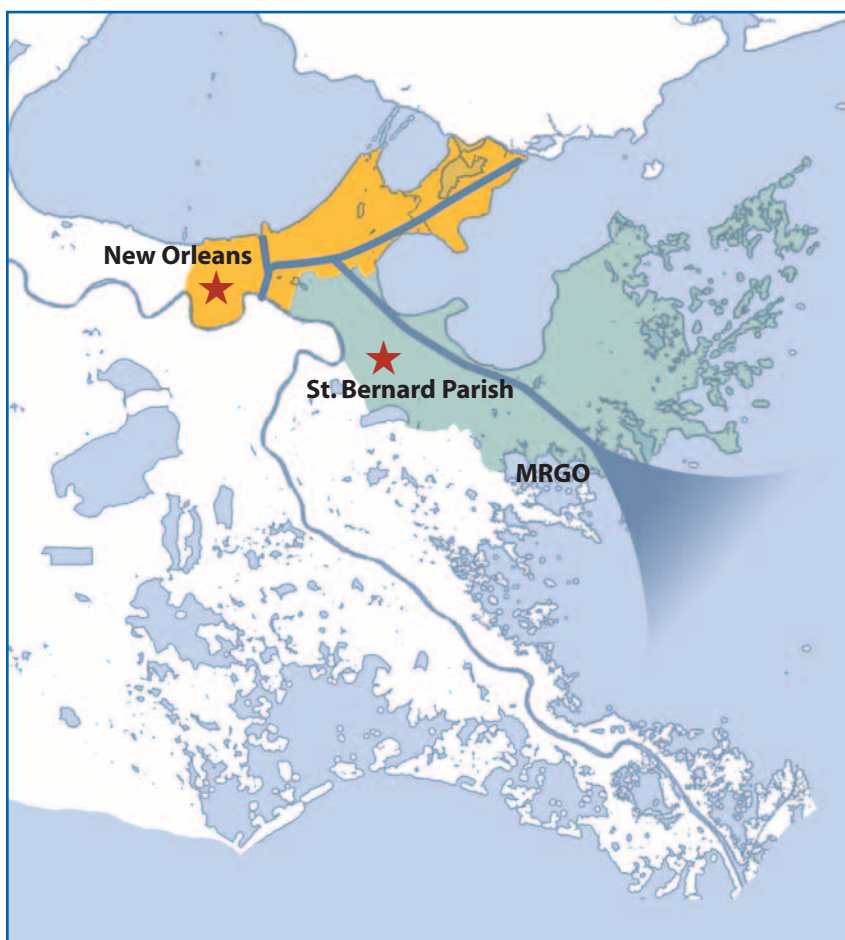
The MRGO Must Go

LESSON: ALLOWING NAVIGATIONAL PROJECTS OR DEVELOPMENT THAT DESTROYS OUR NATURAL STORM BARRIERS WILL ONLY WORSEN THE IMPACTS FROM HURRICANES.

LESSON: PROTECTING OUR BARRIER ISLANDS AND COASTAL WETLANDS WILL PROTECT OUR COMMUNITIES.

The Mississippi River Gulf Outlet (MRGO) is an obscure seldom-used navigation channel built by the Army Corps of Engineers (Corps) as a shortcut linking the Gulf of Mexico to the Port of New Orleans. It has historically been a poster child of poorly-designed Corps projects. When it was proposed in 1958 the US Department of the Interior said *“Excavation [of the MRGO] could result in major ecological change with widespread and severe ecological consequences.”*

Illustration of Mississippi Gulf Outlet



GRN

Critics today claim that the MRGO was responsible for flooding damage during Hurricane Betsy (1965) and that it continues to destroy wetlands today due to saltwater intrusion and wave action within the channel. Community leaders and environmentalists have called for the de-authorization and closure of the MRGO for decades.

When Hurricane Katrina struck the coast of Louisiana, the channel again proved extremely destructive to natural resources and property. The MRGO focused and intensified Hurricane Katrina's storm surge directly into New Orleans. Scientists from Louisiana State University's Hurricane Center say that the MRGO acted as a funnel — increasing the height of the storm surge by several feet and sharply increasing its speed — causing levees to crumble under the assault. The 25-foot wall of water that shot through the MRGO destroyed the levees in its path and inundated St. Bernard Parish and New Orleans' Lower Ninth Ward. The impacts were devastating. Only 52 of 28,000 structures in St. Bernard Parish were unscathed by Katrina. The US Geological Survey estimates that 35 miles of remaining coastal marsh was lost from St Bernard Parish.

The sad lesson here is that we knew coastal wetlands were natural hurricane buffers. As early as 1961, the Corps reported that every 2.7 miles of wetlands absorbs one foot of storm surge. The MRGO was responsible for at least 20,000 acres of pre-Katrina coastal wetland loss. The passage of deep draft vessels along the MRGO scoured the banks and allowed saltwater to intrude into the marshes. The combination of the erosion of the banks and the saltwater intrusion was detrimental to the ecosystem of marshes and cypress-tupelo swamps. These damaged, depleted marshes and swamps could have prevented some of the damage that occurred in August 2005. They could have functioned "like a sponge, absorbing rain and wind," said Craig E. Colten, a geography professor from Louisiana State University and author of *Unnatural Metropolis: Wrestling New Orleans from Nature*.

Despite widespread acknowledgement that the MRGO has been an environmental disaster, the Army Corps of Engineers has continued to dredge and maintain the channel, although dredging has been temporarily halted since Katrina. The annual dredging cost has been about \$22.1 million per year, or approximately \$12,657 per ship that passes through the canal. The amount of shipping traffic in the MRGO continues to decrease despite the fact that the Port of New Orleans traffic has steadily increased. The ship traffic that it was built for has never materialized. However, whenever the community calls for closure, economic reasons are cited for keeping the channel open. It is estimated that for less than \$400 million, the businesses along the MRGO



Warren Zimmermann

Louisiana coastal wetlands

can be moved to a safer location. This cost pales in comparison to the billions of dollars needed to repair the damage to St. Bernard's businesses, schools, parish infrastructure and housing.

The lesson we should have learned before Betsy, and now may have finally learned as a result of the massive destruction from Katrina, is that the MRGO needs to be closed and the important natural hurricane protection provided by marshes and cypress forests restored. The question is whether business as usual will prevail and proposals to close the MRGO will be killed by the Port of New Orleans, or will our politicians have learned the lesson that economic development must be weighed against the need for public safety provided by marshes and wetland forests.

MRGO Facts At-A-Glance

Completed in 1965

Original 650 feet wide x 76 miles long

Now 2,000 feet wide x 76 miles long

290 cubic yards of sand dredged to build the channel

Original cost was \$92 Million

Cost to maintain through 2006 approximately \$906 Million (per Closing the MRGO

Environmental and Economic Considerations, LSU Ag Center, LA Sea Grant)

The MRGO was constructed to provide a shorter safer route from the Gulf of Mexico to New Orleans and Baton Rouge. The channel was designed to be 650 feet wide and 76 miles long. Two hundred and ninety cubic yards of sand was dredged to build this channel, that is sixty cubic yards more than for the Panama Canal. Erosion has expanded the channel to a width of 2,000 feet and continuing – wider and longer than the Panama Canal.



MISSISSIPPI

Hurricane Speed Bumps Must be Rebuilt Naturally

LESSON: PROTECTING OUR BARRIER ISLANDS AND COASTAL WETLANDS WILL PROTECT OUR COMMUNITIES.

Despite the total devastation of the Mississippi Gulf Coast by Hurricane Katrina, it could actually have been worse. Residents say that pockets of homes and businesses were spared the full brunt of the storm due to the natural defense provided by barrier islands.

*Pass Christian, MS after
Hurricane Katrina*



NOAA

The Mississippi Coast is only a little over 100 miles long but many communities once thrived along its edge. Towns such as Waveland and Pass Christian received a more or less direct hit from the fury of Hurricane Katrina and are now severely devastated.

However, there are small pockets — a block or half a block here and there — along the coastline that are relatively undamaged. Residents along the Mississippi coast thank the barrier islands for creating these small pockets of normalcy within the miles of devastation.

The Chandeleur Islands are a string of barrier islands that run from the Mississippi Gulf Coast to the delta of the Mississippi River in Louisiana. Within Louisiana waters, they are a designated Wildlife Refuge, and provide some protection for Mississippi's westernmost Gulf coast. Horn Island, Ship Island, Petit Bois and Cat Island are part of the Gulf Islands National Seashore, a popular tourist area with beautiful sandy beaches that are crucial to the Mississippi tourist economy. In addition to their splendor, they are the first line of defense for coastal communities, acting as hurricane speed bumps that reduce storm surge. These barrier islands act as shock absorbers, reducing the size of the waves that make it to the coast.

All of the barrier islands on the Mississippi Coast were severely damaged by the 2004 and 2005 hurricane seasons. Although the islands have been damaged before, by strong storms like Camille (1968) and Georges (1998), the damage from Hurricane Katrina appears catastrophic. For example, NASA's satellite pictures show that the Chandeleur Islands are almost gone and the east side of Ship Island is greatly reduced. Hurricane Katrina's strong winds, storm surge, and powerful waves obliterated the islands, leaving them much smaller or gone all together.

People are calling for the restoration of the barrier islands because of their importance as natural protection for the shore. However, one of the options for restoration being discussed includes taking concrete and storm debris and towing the materials out into the ocean to rebuild the islands. The efficacy of such a strategy is undetermined, but more importantly, this approach ignores the fact that it would not be necessary to rebuild the islands if they were still able to restore themselves naturally, as they did in the past. Natural rebuilding is threatened because the islands' natural processes have been undermined by nearby dredging for navigational channels. Additionally, recent interest in opening up oil and gas exploration near the islands may cause more damage to the islands.

We also must remember that barrier islands are only part of the solution. In regions of the Mississippi Coast where there were coastal wetlands, there was



NOAA

less devastation from the storm surge. As Rick Clark, Chief of Science and Management for Gulf Islands National Seashore, National Park Service states, "Much is being said about the islands as an important buffer to the coastline, which they are. However, we must not sell the public a false bill of goods in regards to the ability of the islands to protect the coastline from storm surges."

The lessons that we must learn is that barrier islands are essential to storm protection for coastal communities. Before risking the health of those islands, we need to gauge the effect that any activity will have on those islands. We also need improved scientific data and modeling to better understand the effects that any engineered solutions will have on the islands. And we need to combine the natural protections of barrier islands and coastal wetlands to help reduce the damaging effects of hurricane storm surge.

Chandeleur Islands Before and After Hurricane Katrina



ALABAMA

A Half Ounce of Protection

LESSON: ENCOURAGING DEVELOPMENT THAT IS SET BACK FROM THE WATERFRONT WILL PROTECT OUR COMMUNITIES.

LESSON: PROTECTING THE NATURAL HABITAT FOR ENDANGERED SPECIES ALONG THE COAST WILL ALSO PROTECT OUR COMMUNITIES.

To use an old cliché, good things do come in small packages. Who would have thought that a tiny but mighty mouse could save millions of dollars of waterfront property in Alabama? The developments were saved by coastal development setbacks put in place as legal protections for the Alabama Beach Mouse or *Peromyscus polionotus ammobates*, a very long name for a very small mouse.



Alabama Beach Mouse

The beach mouse is a tiny little character, weighing barely half an ounce, yet it makes its home in some of the most enviable real estate in the Gulf — the dunes along the beach. Because it was losing its habitat to development, the beach mouse was placed on the Federal Endangered Species List in 1985. Just as amphibians are used to judge the health of a stream, the presence of beach mice indicates the health of the sand dunes. The mouse's main diet is sea oats. The oats and grasses that beach mice scatter help to stabilize the sand dunes and keep them from blowing away. "Their most important function is as the most abundant small mammal in that ecosystem," declares Jerome Phillips of the Bon Secour Wildlife Refuge.

Despite an area being designated the habitat of endangered species, houses and condominiums can still be built if an "incidental take permit" is obtained from the Fish and Wildlife Service. When developers apply for a permit in an area where there are endangered species, they must create a Habitat Conservation Plan (HCP) to repair or re-create any habitat loss caused by their development.

In the case of the Alabama Beach Mouse, two condominium projects were being built on previously

protected shorelines. Despite having a HCP, they were not doing a good job of protecting the mouse's habitat. When it looked like an additional project was going to be approved for the same area, the Alabama Chapter of the Sierra Club took action and investigated the HCP for the original projects. The HCP was found to be inadequate. The Alabama Chapter filed suit against U.S. Fish and Wildlife to protect the Beach Mouse habitat from further damage. The court ruled in favor of the Beach Mouse. New developments were forced



Coastal Dunes



Orange Beach, AL after
Hurricane Ivan

to build further away from the shoreline, at least 500 feet behind the dunes.

Hurricane Ivan hit the Alabama coast line on September 16, 2004. It is estimated that 90-95% of habitat throughout the range of the Alabama Beach Mouse was affected. While the frontal dunes were impacted, the higher scrub habitat was the least damaged. Buildings constructed within the frontal dunes were heavily damaged while their newer counterparts behind the dunes had less damage because the dunes offered a buffer against the storm.

When the destruction of Katrina followed in 2005, the rebuilt frontal dunes were once again successful storm suppressants, decreasing the power of the storm to harm people and damage property. The direct lesson learned from this experience is that the sand dunes offered a level of protection from the storm surge to reduce the force of the water on developed areas behind the dunes. Building homes and condominiums at least 500 feet back prevented expensive property losses. The best insurance policy we could buy was to protect the habitat of the miniscule Alabama Beach Mouse. What protects their home, protects ours.



Orange Beach, AL before and
after Hurricane Ivan



FLORIDA

Pensacola Beach: Building Code Exemption Hurts Community

LESSON: EXEMPTING DEVELOPMENT FROM BUILDING CODES OR OTHER STORM PROTECTION REQUIREMENTS ONLY WEAKENS A COMMUNITY'S DEFENSES.

Nearly 80% of Florida's residents live in, or within 35 miles of, Florida's coastal communities. Florida has 825 miles of white sandy beaches that attract 35 million tourists each year and pump more than \$41 billion annually into the state's economy. Of course, living in Florida, especially near the coast, also means living with the threat of hurricanes. However, if you live in Pensacola Beach, development has continued in the storm zone, often without following Florida's strict hurricane protection building codes.

Pensacola Beach is located on the panhandle of Florida in Escambia County near the Alabama border. The community has a population of about 56,000 people. It is proud to be the Home of the Blue Angels and generates most of its income from tourism. Famous for its beautiful white sandy beaches, it is now infamous for the damage that was done by hurricanes Ivan and Dennis.

Florida gulf beach



Little known outside of Florida, this area was mostly exempt from Florida's Hurricane Building Code. In 1995, the state of Florida began to revise its building code in response to the terrible damage caused by Hurricane Andrew on the southern tip of Florida centering in the greater Miami region. The new hurricane code was praised throughout the Gulf region. The standard protects structures from windborne debris up to 120 mph. Reports by FEMA and engineers after the hurricanes of 2004 and 2005 indicate that new buildings built to this code fared better than others that were built before the code was adopted in 2001.

Escambia County, and the neighbor to the east, Santa Rosa County, are among the poorest counties in the state of Florida. Special interests, such as the Florida Home Builders Association, pushed building code exemptions for the Panhandle. Exemption proponents argued that the Panhandle was less hurricane-prone than the rest of Florida and that, with the added cost of hurricane protection, the low-income population of the county would be unable to rebuild or to afford new homes. The exemption provides that all properties are exempt from the code with the exception



of new properties being built within one mile of the coast. As a result, existing houses on the coast were not required to rebuild stronger and safer.

The public officials who insisted that the panhandle wasn't prone to hurricanes were proven wrong very quickly when Hurricane Ivan (2004) and Hurricane Dennis (2005) blew inland causing damage to almost 185 miles of the panhandle region. Estimates from the American Red Cross of uninsured damages after Hurricanes Ivan and Dennis were eight million dollars. Despite the protest from local officials and the Florida Home Builder's Association, the 2006 Florida legislature passed a bill requiring the Florida State Building Commission to do a study and create new rules for the exempt areas in the state.

Governor Jeb Bush was cited in the Pensacola News as having "joined Florida's insurance industry in saying it makes no sense to exempt part of the state from building codes proven to protect homes and lower insurance losses after hurricanes." The bill that was passed during the 2006 Florida legislative session may result in eliminating the exemption for Escambia County if the public and the Governor continue to put pressure on the Florida State Building Commission. Unfortunately, the new building code requirements will not be in place for the 2006 hurricane season.

The state's hurricane code can work and should be applied across Florida and the rest of the Gulf. In fact, in 2004, 38 people rode out Ivan in the University of Florida's hurricane house in Pensacola Beach. Despite the strength of the storm, the house suffered little damage. Other structures nearby were severely damaged.

We know that we cannot stop people from wanting a home on or near the beach, and Pensacola Beach's economy depends on attracting people to its beaches. However, it is clear that steps can be taken that will save lives and property when the next storm comes. Improved building methods are a benefit for everyone. They help our economy by reducing risk and provide safer shelter for people on the coast.

Debris along the road in the panhandle after Hurricane Ivan

HURRICANE RESISTANT BUILDING METHODS

- Storm resistant windows and doors
- Reinforced Garage Doors
- Hip roofs are less apt to have wind damage
- Ring shank nails in shingles
- Roof rafter connectors
- Steel framed houses with insulation between framing and siding not inside the walls
- Paperless gypsum wallboard
- Structured Insulated panels
- Drainage plane set up behind brick cladding

• Use plywood painted on both sides or fiber-cement board for soffits.

For more information:

http://www.agcenter.lsu.edu/en/family_home/home/design_construction/

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TEXAS

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LOUISIANA

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MISSISSIPPI

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FLORIDA

Building Code changes and development

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www.cse.noaa.gov/opis/html/bchleg.htm

www.leg.state.fl.us

OIL & GAS IN THE GULF

Oil rigs lost

www.mms.gov/ooc/press/2006/press0501.htm

www.rigzone.com/news/article.asp?a_id=32308

Murphy Oil

www.murphyoilcorp.com/ir/katrina/

www.murphyoilcorp.com/ir/katrina/pdf/Murphy%20Oil%20Spill%20Fact%20Sheet%20Jan.%202006.pdf

www.bt.cdc.gov/disasters/hurricanes/katrina/murphyoil/

www.murphyoilspillinfo.com/gallery.asp

www3.deq.louisiana.gov/news/pdf/MurphyOil.pdf

ORGANIZATIONS TO CONTACT FOR MORE INFORMATION:

TEXAS

Galveston Bay Conservation and Preservation Association

281-326-3343

www.gbcpa.net

Lone Star Chapter of the Sierra Club

512-477-1729

www.texas.sierraclub.org

LOUISIANA

Delta Chapter of the Sierra Club

225-925-8650

www.louisiana.sierraclub.org

MRGO Must Go Coalition

www.mrgomustgo.org

MISSISSIPPI

Gulf Islands Conservancy

228-323-1668

www.gulfislandsconservancy.com

Mississippi Chapter of the Sierra Club

601-352-1026

www.mississippi.sierraclub.org

ALABAMA

Alabama Chapter of the Sierra Club

www.alabama.sierraclub.org

Mobile Baykeeper

251-433-4229

www.mobilebaykeeper.org

FLORIDA

Gulf Coast Environmental Defense

850-432-3001

Florida Chapter of the Sierra Club

(727) 824-8813

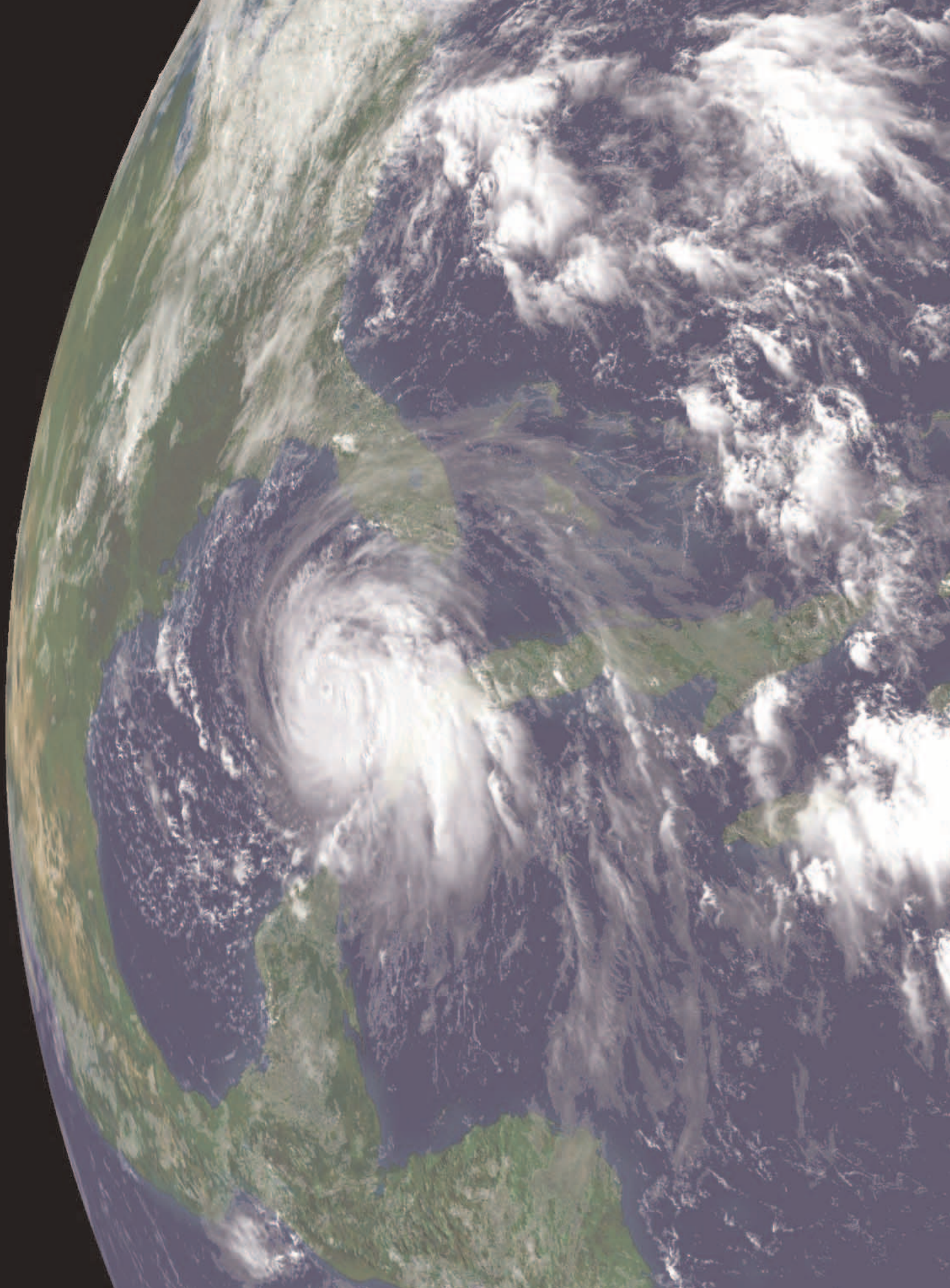
www.florida.sierraclub.org

GULF-WIDE

Gulf Restoration Network

504-525-1528

www.healthygulf.org





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