

# TAKING A LONGER VIEW:

## Mapping for Sustainable Resilience

*A Project of the National Consortium to Map Gulf Coast  
Ecological Constraints | APRIL 2006*

Co-chairs:

Regional **Plan** Association  
NJ CT  
NY

THE UNIVERSITY OF  
**TEXAS**  
AT AUSTIN

Maps and analysis:

**EDAW**

**Millions of people in Louisiana and Mississippi were displaced by Hurricane Katrina and Hurricane Rita. As of December 20, 2005, FEMA had taken 2,530,657 registrations from victims. There is much debate on where, and how, rebuilding should take place. In some areas, safe drinking water may not be available for years to come. Should we rebuild in the same places, or do we need to rethink how and where we build along the Gulf Coast?**

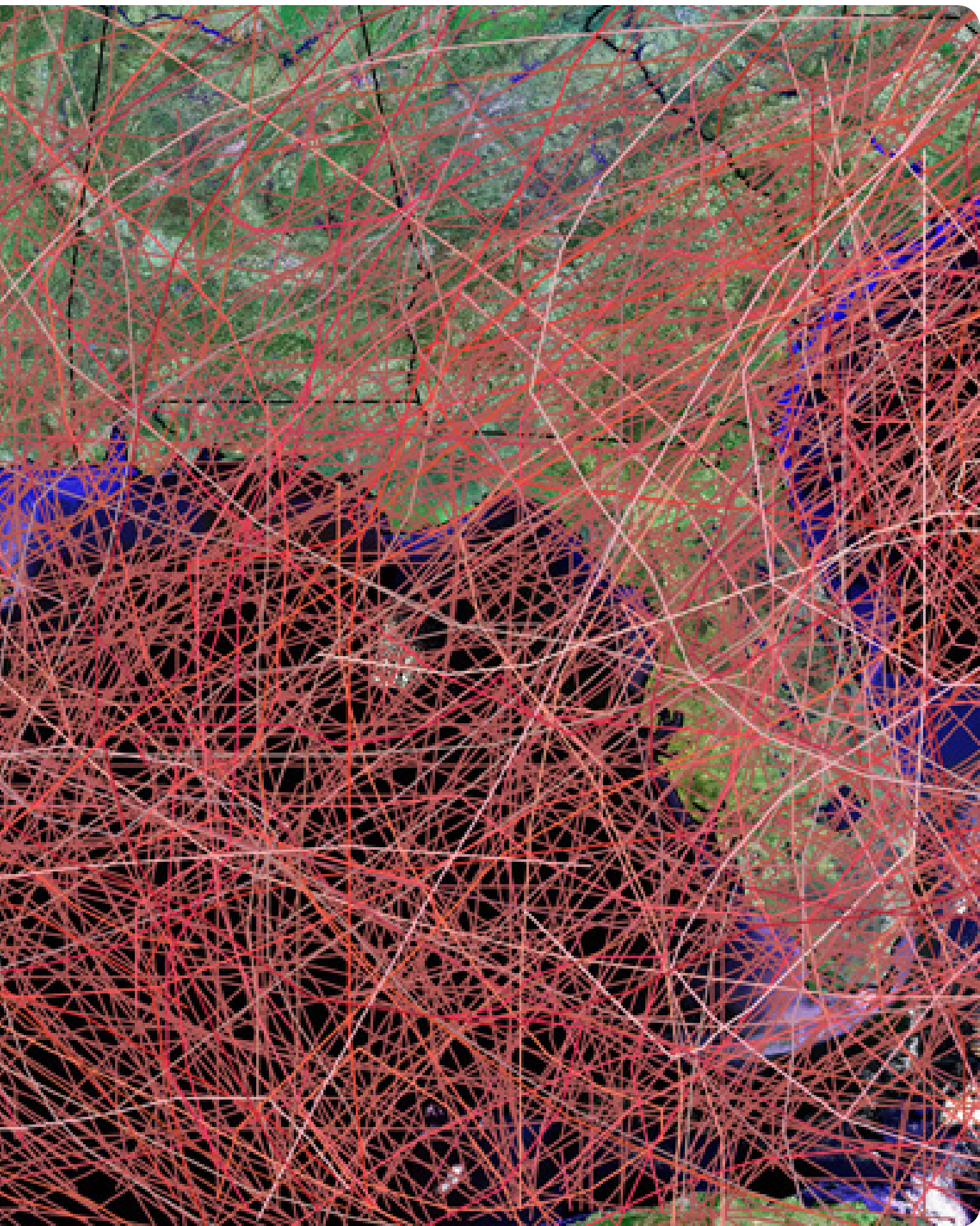
**In the aftermath of the Gulf Coast devastation, Regional Plan Association partnered with the University of Texas at Austin to attempt to answer these and other questions. They convened the National Consortium to Map Gulf Coast Ecological**

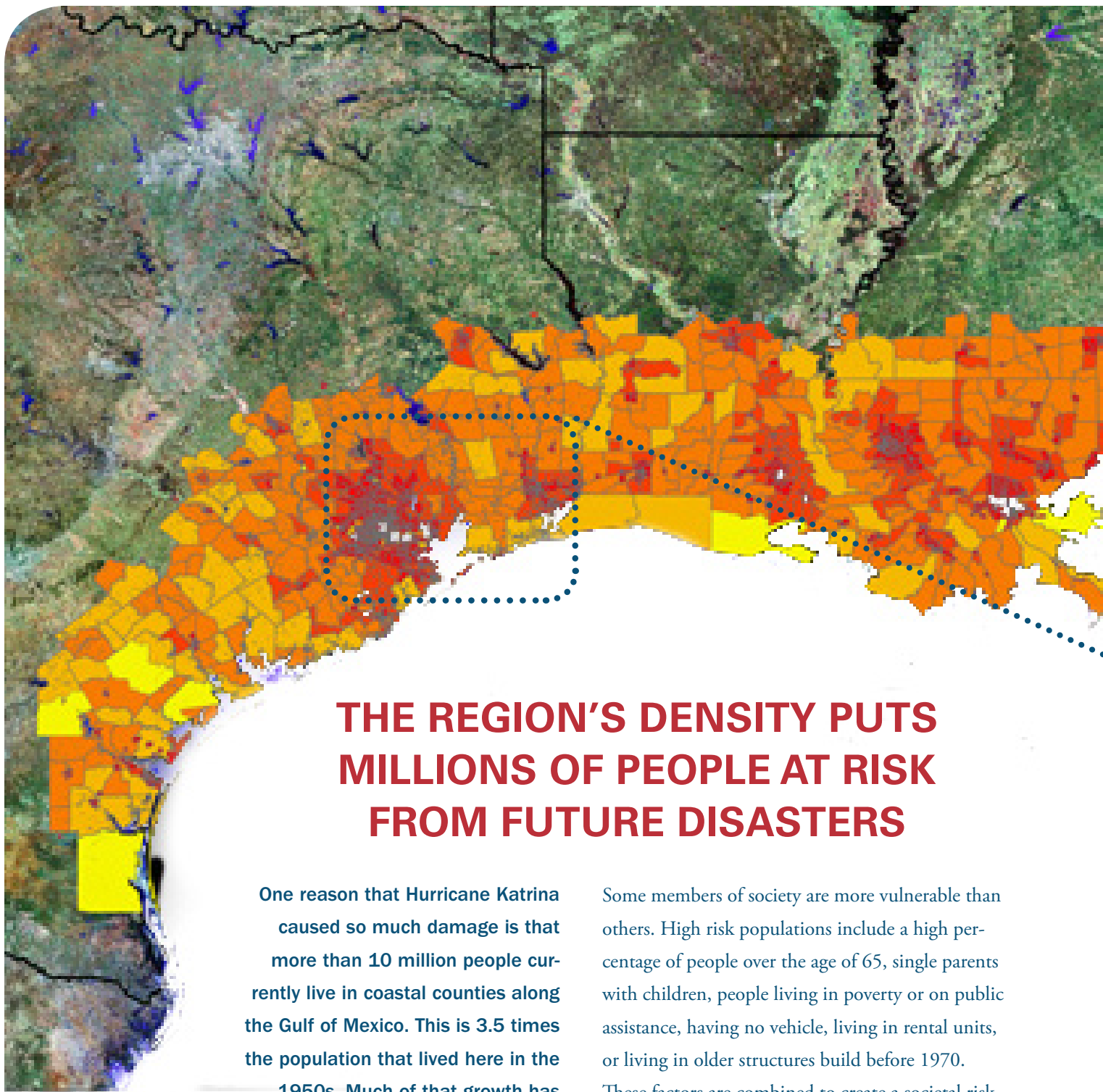
**Constraints to** advise this effort, comprised of leading architects and landscape architects, urban planners, environmental and geographic scientists and other leading professionals in related fields. The result was a series of maps, prepared by consultants EDAW, which graphically illustrate the continued vulnerability of the Gulf Coast to storms and sea level rise, including many areas that are slated to be rebuilt with billions in public funding. RPA and the University of Texas at Austin hope that the following maps and descriptions will help planners determine how to sustainably rebuild the Gulf Coast and encourage other regions to perform similar analyses so that damage can be limited should disaster strike in the future.

A satellite map of the Gulf of Mexico and the surrounding landmasses of North and Central America. Overlaid on the map are numerous red lines representing the tracks of severe storms and hurricanes. The tracks are most concentrated along the Gulf Coast of the United States and the northern coast of South America. A black outline of the United States is visible in the upper left portion of the map.

## THE GULF COAST HAS A HISTORY OF NATURAL DISASTERS THAT IS EXPECTED TO CONTINUE

A major hurricane has hit the Gulf Coast every year since 1994, and, in 2005, the area experienced 26 named storms and 14 hurricanes, 7 of them major. But this area has been historically hard hit. This map, showing all of the severe storms that hit the Gulf Coast from 1851 to 2000, helps illustrate the potential danger associated with living in the region. The map was generated using the National Oceanic and Atmospheric Administration's (NOAA) Historical Hurricane Tracks tool, an interactive mapping application that allows you to search and display information about hurricanes in the Gulf Coast and along the eastern seaboard.





## THE REGION'S DENSITY PUTS MILLIONS OF PEOPLE AT RISK FROM FUTURE DISASTERS

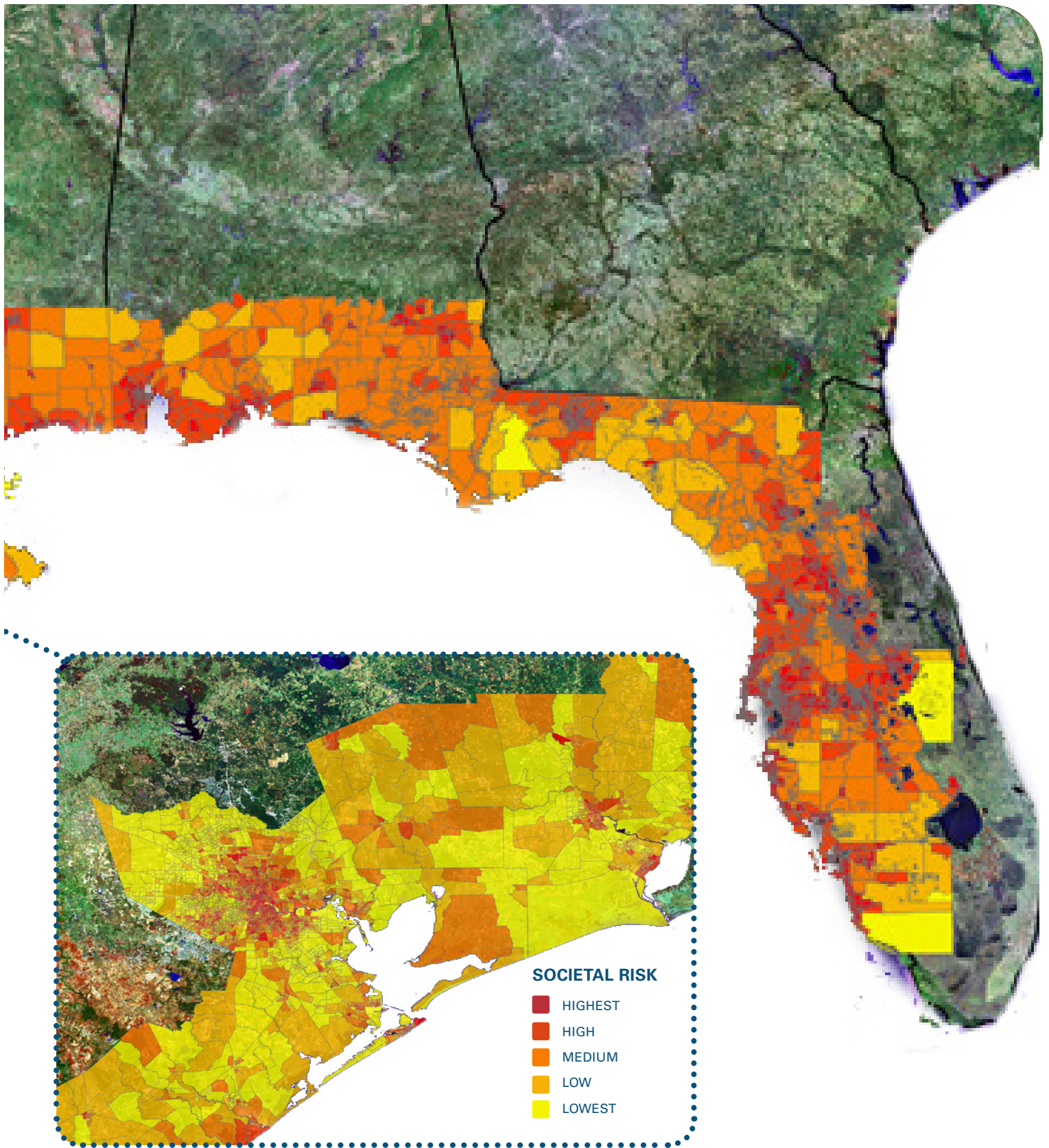
One reason that Hurricane Katrina caused so much damage is that more than 10 million people currently live in coastal counties along the Gulf of Mexico. This is 3.5 times the population that lived here in the 1950s. Much of that growth has occurred because of a lull in severe storms along the Gulf Coast over the last couple of decades.

Some members of society are more vulnerable than others. High risk populations include a high percentage of people over the age of 65, single parents with children, people living in poverty or on public assistance, having no vehicle, living in rental units, or living in older structures build before 1970. These factors are combined to create a societal risk map using data from the Coastal Risk Atlas (CRA). CRA is a project operated by the NOAA Coastal Data Development Center (NCDDC) in collaboration with the NOAA Coastal Services Center (CSC). The CRA can be used to identify high-risk demographic areas, as well as those that are vulnerable to storm surge, flooding, and high winds.

### DENSITY LEVELS

- HIGHEST
- HIGH
- MEDIUM
- LOW
- LOWEST





**CERTAIN SEGMENTS OF THE POPULATION  
ARE AT GREATER RISK**



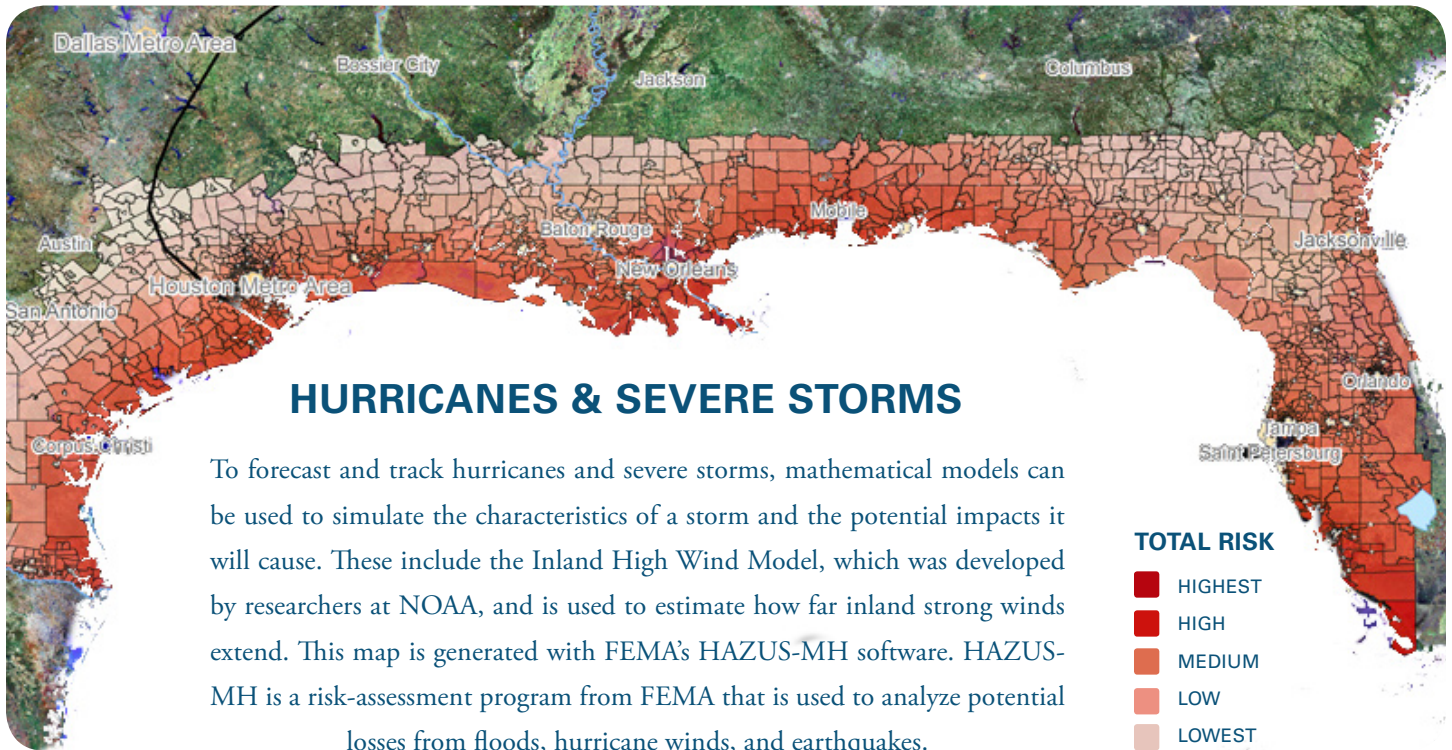
## THERE ARE MANY NATURAL THREATS THAT MAKE MUCH OF THE AREA VULNERABLE

The National Consortium to Map Ecological Constraints is developing a model that focuses on mapping environmentally-sensitive areas of the Gulf Coast Region, and classifying potential risks associated with natural disasters. Among the factors being addressed in the process are historic hurricane tracks, high wind risk areas, storm surges, flooding, significant flooding events, rise in sea elevation, loss of wetlands, marshes, and barrier islands, economic impacts, demographic vulnerability, and growth patterns. By combining these factors into one comprehensive model (above), the resulting analysis can then be used to create public and private sector policies that reduce impacts from future hurricanes and severe storms.

### COMBINED RISK

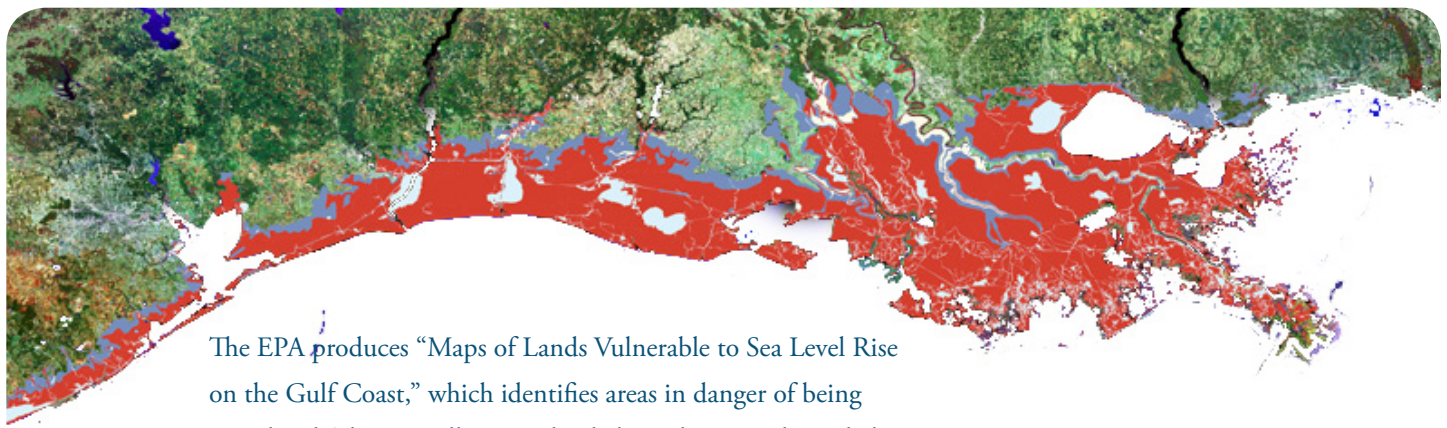
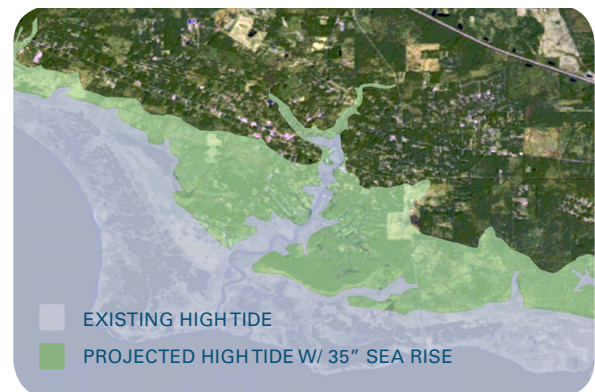
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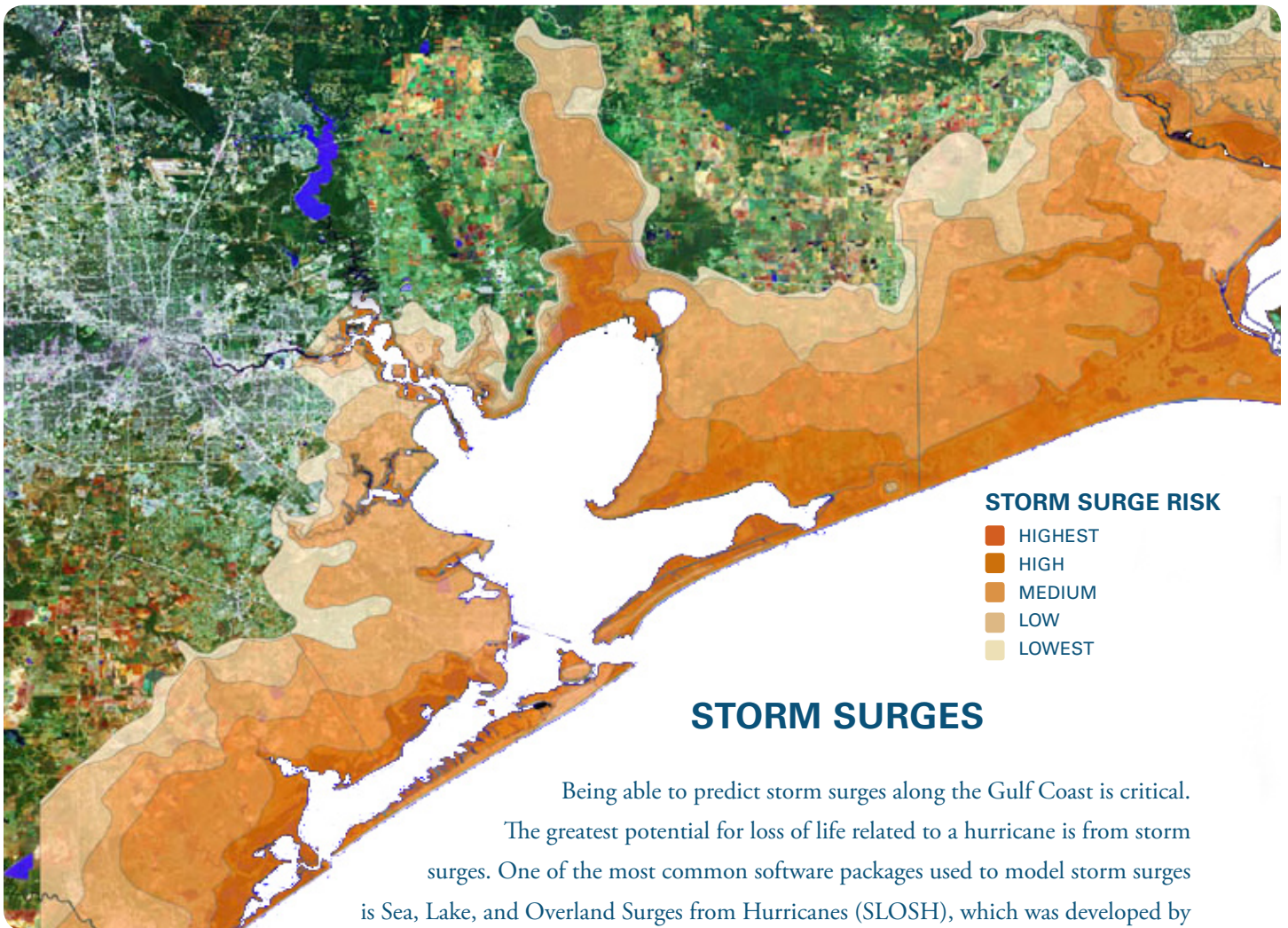
## RISE IN SEA LEVEL

According to the 1989 Congress Report on Climate Change, 20% of the US coast, including the Gulf Coast, will be impacted by sea level rise. Scientists predict that in the next 50 to 100 years, we can expect the sea level to rise 21" to 44". This map indicates the impact that a rise in sea level would have on high tide at Lacombe, Louisiana.



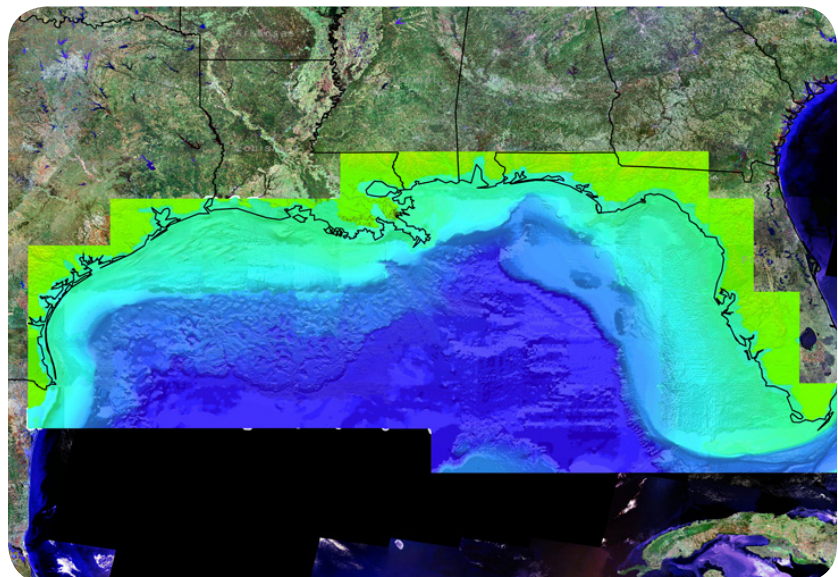
The EPA produces "Maps of Lands Vulnerable to Sea Level Rise on the Gulf Coast," which identifies areas in danger of being inundated. This map illustrates land along the coast that is below the 1.5-meter contour, and below the 3.5-meter contour, since these areas are the most likely to be impacted by a rise in sea level.



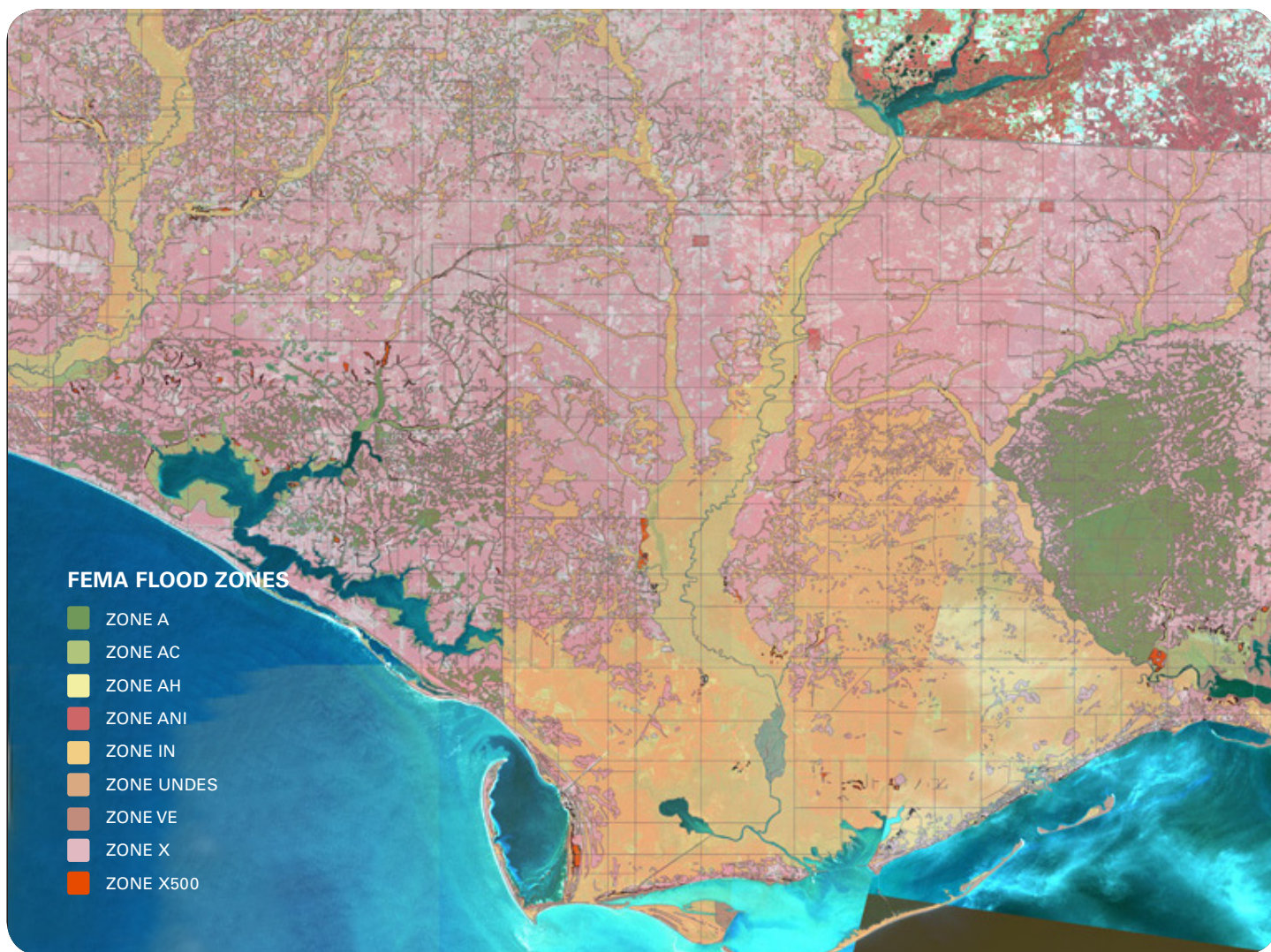


Being able to predict storm surges along the Gulf Coast is critical. The greatest potential for loss of life related to a hurricane is from storm surges. One of the most common software packages used to model storm surges is Sea, Lake, and Overland Surges from Hurricanes (SLOSH), which was developed by the National Weather Service. The map above indicates the potential risk from storm surges along the Texas coast near Houston.

Bathymetry shows the depth of the ocean floor from the water surface. The shallow coastal bathymetry along the Gulf coast has a significant impact on storm surge potential. Currents and tides are controlled by the basins and ridges that make up this undersea terrain.







## FLOOD ZONES

FEMA's Q3 floodplain maps indicate flood risks for a specific area based on local topology, hydrology, precipitation, and measures to provide flood protection. Q3 Flood Data product is designed to serve FEMA's Response and Recovery activities as well as to provide the foundation for flood insurance policy marketing initiatives. Many areas along the Gulf Coast, such as this section of the Florida Panhandle, are susceptible to flooding in low-lying areas.

# CREDITS AND ACKNOWLEDGMENTS

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Special thanks to:

*Barbara Faga*, Chair of the Board, and *Jim Sipes*, Senior  
Associate of EDAW for their pro bono work to create  
the maps and analysis of the Gulf Coast.

*Congressman Earl Blumenauer*, for hosting a meeting to  
“Envision the Gulf Coast” on November 3, 2005 at the  
United States Library of Congress.

*Nancy Somerville*, Executive Vice President and CEO of  
the ASLA for hosting a meeting of the National Consor-  
tium in Washington, D.C. on December 19, 2005.

*Jack Dangermond*, *Bill Miller* and *Mike Flaxman* of ESRI  
for their contributions in providing strategic direction to  
the project.

Graphic design by *Mihae S. Mukaida*, Intern, Regional  
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