

## THE FLOOD THREAT RESPONSE IN SOUTH LOUISIANA

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### Abstract

The flood threat to the people of Louisiana is ever present. Responses to reducing the flood threat have been relocation, structural and regulatory. All of these responses effect the surrounding environment in a South Louisiana wetland community.

### Introduction

The communities of South Lafourche have evolved from the migration of people from the coast in response to the effects of hurricane flooding. The devastating Hurricanes of 1893 and 1915 dictated that the fishing community would be miles away from its fishing grounds. These communities remained heavily dependent on the coastal resources for commerce and recreation. The people chose relocation to higher ridge land, 20 miles from the coast, rather than chance another hurricane with homes and families at risk on the edge of the Gulf of Mexico.

River flooding was being addressed in the area by blocking and controlling the rivers and bayous with levees. To stop Bayou Lafourche from flooding the area, it was blocked at its intersection with the Mississippi River, 120 miles up the bayou from its mouth. With Bayou Lafourche no longer a tributary of the Mississippi and the improvements of the Mississippi River levees, river flooding became practically non-existent. Almost immediately the effects of the closure of Bayou Lafourche became evident in Leeville where practically all farming became impossible due to the increase in salinity.

In the 1930's, the oil industry began to greatly affect Leeville and Golden Meadow. The population of fishermen was increased by oilfield workers and their families. The cutting of navigation canals and oil field location canals also greatly affected many marsh areas. The need to use a greater land base and provide for this new industry continued to

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change the natural process of the marshes.

### Effects of Development

The mainline Mississippi River levees, extensive navigation and oil field canals, and human habitation had greatly altered the Louisiana coastal zone before the effects of these activities on the wetlands were understood. Although wetland loss was noticed, it was not quantified until a 1970 report by Gagliano and Van Beek (EPA 1987). Since that time the effects of work in the marsh is better understood, but many activities which degrade the wetlands still occur due to the tremendous momentum and prosperity that have resulted from these activities.

The seafood industry supported the settlement of people on the ridgeland in the wetland. The development of the oil industry increased the population and lead to housing developments being constructed in marsh areas which were leveed and maintained in a dry condition by pumping.

These drainage levees were inadequate to protect the inhabited areas from an increasing number of floods due to hurricanes. United States Army Corps of Engineers sponsored hurricane protection projects have been under construction in many areas of Southeast Louisiana. All populated areas of South Louisiana are beginning to request more hurricane protection.

These drainage and hurricane systems have taken marsh from its functions as a wetland, but not to the expanse and degree of the Mississippi River levee system. This flood prevention system, along with federally sponsored navigation projects, has played a major role in the deterioration of Louisiana's coastal wetland (Frugé - 1980).

### Flood Protection Results

The success in protecting the inhabitants of Coastal Louisiana from river flooding has resulted in an increased chance of tidal flooding. Without the sediments borne by flood waters from the Mississippi River to replenish the loss of elevation due to subsidence, the wetland and ridges drop in relation to sea level. Terrebonne Parish is expected to experience a relative seal level rise of .62 - 2.80 m in the next 100 years (Penland et al 1988).

Although this relative sea level rise rate in Terrebonne Parish cannot be expected throughout the region, similar losses in elevation throughout the parishes of Southeast

Louisiana can be expected. The majority of Southeast Louisiana is comparable to Terrebonne Parish due to being similarly created by the Mississippi River, with variations occurring only in degree of relative sea level rise (Penland et al 1988).

This rise in water levels can cause loss of wetland habitat and eventually erode and submerge dry land. This process greatly increases the tidal flood threat. Miles of land less the 15 ft. in elevation exist in Coastal Louisiana.

Hurricane surges up to 20 ft. can flood land for miles from the coast. (Penland, Suter 1988). Although Louisiana does not have many residents living on the edge of the Gulf of Mexico, it has many thousands on this susceptible eroding plain. Flood surge computer models predict up to 20 ft. deep floods 30 miles from the coast according to the Southeast Louisiana Storm Surge Atlas, 1985.

Although this tidal flood threat has slowly increased over the last 50 years, residents of coastal parishes have taken notice. Half of the people asked about relocating the entire community due to sea level rise and coastal erosion, agreed that it was a positive response to the problem (Laska, Emmer 1992). Laska and Emmer also report the majority of officials believed that a solution could be found to solve the problems of sea level rise and coastal erosion without the need for relocation.

### Conclusion

At the turn of the century, two hurricane disasters occurred: The 1893 Cheniere Caminada Hurricane which destroyed the community of Cheniere Caminada killing 700 people of that community, and a total of 2,000 people killed in the entire Barataria Basin, and the 1900 hurricane which killed 6,000 people at Galveston, Texas. Two tragedies similar in scope but completely different in response.

The survivors of Cheniere Caminada relocated on higher land miles from the coast. In Galveston, with the help of the federal government, the town was rebuilt and constructed a seawall.

In the future the government will decide either to rebuild or relocate after the next disaster. In Louisiana's coastal zone another governmental choice has begun to begin rebuilding the natural barriers to tidal flooding. A great commitment in resources will be necessary to achieve the environmental and flood protection needs in Southeast Louisiana.

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## KEY WORDS

Hurricane  
Parish  
Levee  
Relative Sea Level Rise  
River Flooding  
Tidal Flooding

**DEFINITION OF KEY WORDS**

**Hurricane**: A tropical storm characterized by wind velocity of 75 mph and a defined calm center.

**Levee**: An elevation bank adjacent to a waterway.

**Parish**: A governmental unit in Louisiana analogous to county.

**Relative sea level rise**: A long term absolute vertical relationship between the land and water surfaces, excluding the short-term effects of wind and astronomical tides.

**River flooding**: A condition which occurs when a river overtops its banks.

**Tidal flooding**: When water is forced over land by tidal forces.