

## 1956 to 2008 Land Area Changes—Delacroix, Louisiana



### Explanation

- 1956 to 1978 Loss
- 1978 to 2004 Loss
- 2004 to 2006 Loss
- 2006 to 2008 Loss
- 2008 Water
- 1956 to 1978 Gain
- 1978 to 2004 Gain
- 2004 to 2006 Gain
- 2006 to 2008 Gain
- 2008 Land
- 2001 Fresh-Intermediate Marsh Community Boundary
- 2001 Intermediate-Brackish Marsh Community Boundary
- 2001 Brackish-Fastland Marsh Community Boundary
- 2001 Brackish-Saline Marsh Community Boundary
- Hurricane Katrina surge-removed, surge-compressed, and surge-scoured marsh trend comparison area

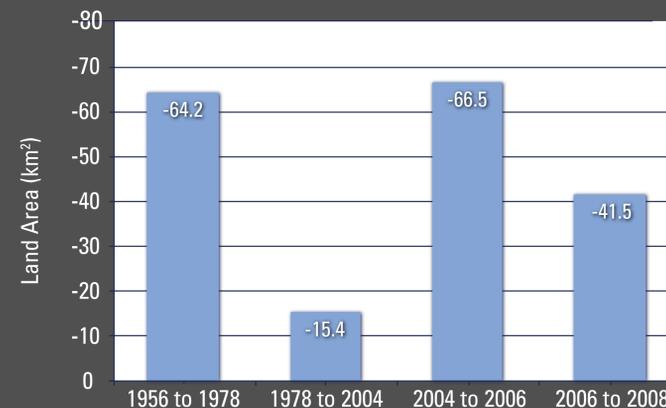


Figure 1. Net land area trends from 1956 to 2008 for Delacroix, Louisiana.

Hurricane Katrina (August 29, 2005) caused widespread surge-induced marsh scouring, marsh removal, and marsh compression between Delacroix and the east bank of the Mississippi River. Many of these ponds were partially revegetated by the summer of 2008. Large amounts of surge-removed vegetation were deposited as wrack along the west- and south-facing sides of flood protection levees in 2005 and 2008 and are classified as post-2004 land gain. Hurricanes Ike and Gustav reactivated Hurricane Katrina-formed ponds by removing recovery vegetation, including large amounts of aquatic vegetation. The 2006 to 2008 loss depicted within the seaward intermediate marsh and brackish marsh areas is indicative of increased water area caused by higher water levels on the 2008 image. These shallow marsh scours were formed by Hurricane Katrina and vary somewhat in extent based on water levels at image acquisition. The 2006 classified land and water data are based on a Landsat Thematic Mapper (TM) 5 image acquired on October 28, and the 2008 image was acquired on October 1. The average hourly water level, using the station datum at NOAA tide station 8761724, at 11:00 Local Standard Time (LST) on October 28, 2006, was 1.7 m and was 2.1 m on October 1, 2008.

Table 1. Net land area measurements from 1956 to 2008 for Freshwater Bayou, Louisiana. [Area measurements provided in km<sup>2</sup>]

Year	Land	Water	Total
1956	418.2	126.7	545.0
1978	345.0	190.9	545.0
2004	338.7	206.3	545.0
2005 <sup>1</sup>	242.4	302.6	545.0
2006	272.2	272.8	545.0
2008	230.7	314.3	545.0

<sup>1</sup>Land and water area estimate acquired 2 months after Hurricane Katrina's landfall (Barras, 2006).

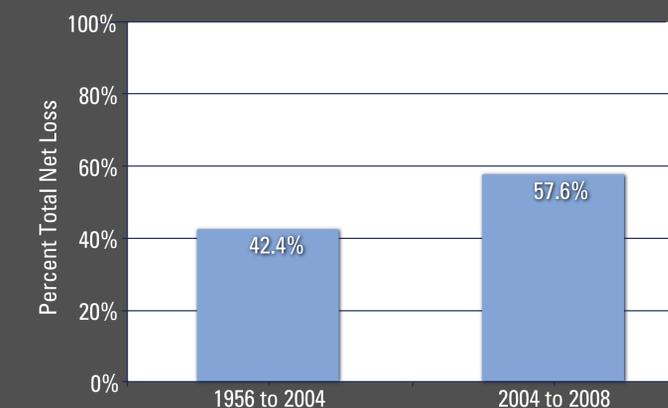


Figure 2. Percent net land loss from 1956 to 2004 and from 2004 to 2008 for Delacroix, Louisiana.

The brackish and intermediate marsh scours caused by Hurricane Katrina had not revegetated by 2008. They also do not exhibit floating aquatic vegetation growth. However, the classified water area of these features tends to shrink and expand based on tidal and meteorological conditions.

The majority of the post-2004 loss was caused by Hurricane Katrina, based on the 11.7 km<sup>2</sup> land area decrease from 2005 to 2008. These measurements represent near post-storm conditions for both hurricane sets, rather than the 2006 measurement, which represents conditions 1 year after hurricanes Katrina and Rita. Post-2004 loss within the area exceeds the loss during the 1956 to 2004 period. The 15.4 km<sup>2</sup> loss from 1978 to 2004, over 26 years, occurred during a period of minimal strong hurricane impacts within the Delacroix area, with the exception of Hurricane Andrew (August 26, 1992). The 1956 to 1978 period was characterized by several strong hurricanes that directly impacted the area. They include hurricanes Hilda (October 3, 1964), Betsy (September 9, 1965) and Camille (August 18, 1969). Further examination of loss timing and magnitude during the 1956 to 1978 period may provide some link to these hurricanes.