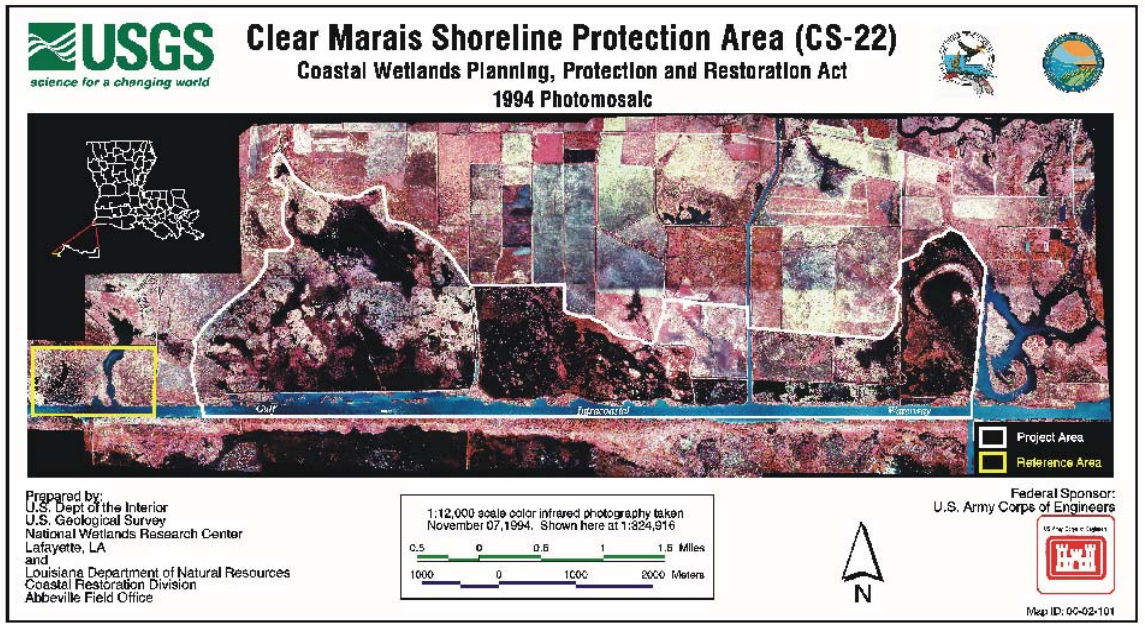
CLEAR MARAIS SHORELINE PROTECTION (CS-22)

- Selected on 2nd Priority Project List
- Construction completed in March 1997
- Location: Calcasieu Parish along the north bank of the Gulf Intracoastal Waterway (GIWW), 5 miles to the west of Hwy 27

Project Number CS-22

Project Location

- Project Features
  - A continuous rock dike along 6.6 miles (approx. 35,000 feet) along the north bank of the GIWW



Planning

- Assumed Causes of Loss:
  - Erosion of the GIWW bank - It was assumed that the bank would continue to erode and breach into the project area if nothing was done. The interior wetlands were assumed to be stable and would continue to be stable as long as the bank of the GIWW remains intact.

Goals and Objectives

- Objective - Maintain and protect approximately 35,000 linear feet (10,668 meters) of a management levee along the north bank of the GIWW that will contribute to protecting the integrity of the freshwater marshes of Clear Marais adjacent to the GIWW
- Goal - Decrease the rate of shoreline erosion along the north bank of the GIWW south of the Clear Marais marshes through the use of a rock breakwater

Construction

- Final Features
  - A rock dike was constructed on top of geotextile fabric along 6.6 miles (approx. 35,000 feet) of bank line to prevent further erosion of the north bank of the GIWW
  - Most of the dike was a foreshore type, and it was built with a top elevation of +3 ft. (+.09 meters) NGVD83, 1 vertical on 2.5 horizontal side slopes, and no specified crown width. **This was the USACE's first "pointy dike".**

Construction (continued)

- Final Features (continued)
  - The dike was tied into the shoreline at both ends of its length and at the Brannon Canal which was left open
  - An access gap, lined with rock, was left in the rock dike at one location for the owner's access

Monitoring Variables

- **Aerial photography** - To document vegetated and non-vegetated areas, color infrared aerial photography will be geo-rectified using National Wetland Research Center (NWRC) standard operating procedures in 1996 (pre-construction) and in 2006 and 2015 (post-construction)
- **Shoreline Change** - 35 shoreline markers have been placed at points along the vegetated marsh edge adjacent to the rock breakwater at a max interval of 1000 feet. A GPS coordinate has been obtained for each shoreline marker

Physical Response

- Hydrology - The marsh in the project area is hydrologically isolated from the tidal system, which is the preferred hydrology
- Salinity - The salinity that supports healthy marsh in the project area is as close to zero as possible; the project was designed to prevent salinity encroachment into the project area by maintaining an existing levee

Physical Response (continued)

- Shoreline Erosion
  - Shoreline gains have occurred at 24 of the 34 sampling sites behind the rock breakwater
  - Overall, project has gained 12.99 feet/year of land behind the breakwater
  - The project has shown that, not only protecting the shoreline, but also increasing land to water ratios behind the rock breakwater can be obtained in a few years

Physical Response (continued)

- Soil type and elevation were not factors used for analysis of this project

Biological Response

- No vegetation data collection
- Entire area has been classified as fresh marsh

Landscape Response

- Pre-construction photography was collected in 1994 in both the project area and a reference area and classified into land and water. Post-construction photo acquisition is scheduled for 2006
- 4,337-acre project area: 1,456 acres of land (33.6%) and 2,881 acres of water (66.4%) in 1994
- 328-acre reference site: 257 acres of land and 71 acres of water
- The project area is being maintained as it is. The desired response is no-change

Project Adaptive Management

- Implemented Changes
  - Nothing has been done and nothing is necessary to improve the project

Project Adaptive Management

- Recommended Improvements
  - Install secondary monuments on the east and west ends of the project in order to improve future elevation maintenance surveys
  - On all shoreline protection projects, maintenance surveys should be used to monitor and evaluate shoreline protection features, including accretion and toe scour
  - The maintenance survey would need to include a DGPS shoreline survey of the vegetated marsh edge in both the project and reference area

Lessons Learned for Future Projects

- Incorporated in the CWPPRA Process
  - None

Lessons Learned for Future Projects (continued)

- Recommended for Incorporation
  - Information is being collected through a cooperative effort between the monitoring program and the maintenance program to document accretion behind the dike; this project benefit is not captured in the project goals or objectives, but is believed to be worthy of documentation. Both the monitoring and maintenance programs are contributing to surveys so that efforts are not duplicated

Lessons Learned for Future Projects (continued)

- Recommended for Incorporation
  - Due to the minimal settlement occurring at this project, the use of geotextile fabric may not be necessary in areas with similar soil types; other projects in similar soils should be investigated to determine if geotextile is necessary
  - There may not be a necessity to monitor land/water ratios if maintaining a certain ratio is not a project goal or objective