

Atchafalaya Sediment Delivery Project

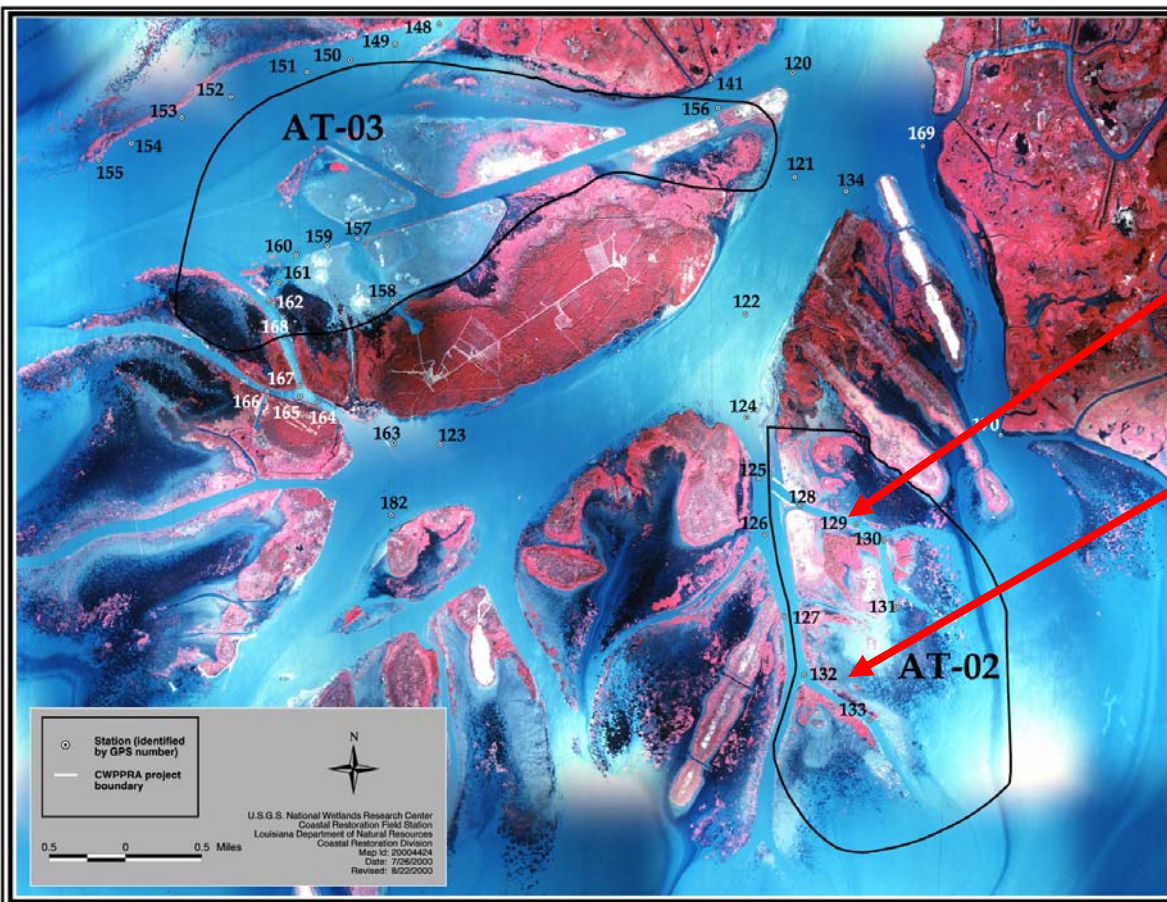
- Selected on PPL 2
- Construction finished March, 1998
- Location:



Project Location

● Project Features

- Re-open Natal channel for 8,800 linear feet.
- Re-open Castille Pass for 2,100 linear feet.



Planning

- Assumed Causes of Loss:
 1. Very little loss in project area, 1956-1978 & 1978-1990 = $0.1 \text{mi}^2/\text{yr}$.
 2. Decrease in delta development to the east. Lower Atchafalaya River Navigation Channel maintained by the USACE for navigation purposes. Creating an efficient conduit for river sediment to the Gulf of Mexico. Distributary channels in the eastern portion of the Atchafalaya delta have undergone significant reductions in cross-sectional area and flow efficiency.

Goals and Objectives

- To increase the distributary potential of Natal Channel and Castille Pass by increasing their cross-sectional area and length.
- Create approximately 230 ac of delta lobe islands through the beneficial use of dredged material at elevations suitable for emergent marsh vegetation.
- Increase the rate of sub-aerial delta growth in the project area to that measured from historical photographs since 1956.
- Increase frequency of occurrence of submerged aquatic vegetation.
- Restore Natal Channel and Castille Pass to functioning tertiary distributary channels thereby enhancing the system's natural delta-building potential.
- Utilize dredged material from the dredging of Natal Channel and Castille Pass to create delta lobe islands suitable for establishment of emergent marsh.

Construction

- Final Features

- Creation of 185 wetland acres (+3 ft to +1.5 ft NGVD) with dredge spoil. Construction datum was 0.75 ft lower than actual datum, resulting in higher finished elevation than desired. Thus, reducing the number of constructed wetland acres created.
- Dredged 2,108 ft in Castille Pass and 9,200 ft in Natal Channel. Dropped northern branch within Natal Channel (around Teal Island) and added length to the southern branch.
- Re-dredge head of Natal Channel 7 months after construction.
- Some dredge material (amount is unknown) was placed at the toe of Rodney Island, however, its influence on the vegetative communities of Rodney Island is unknown.

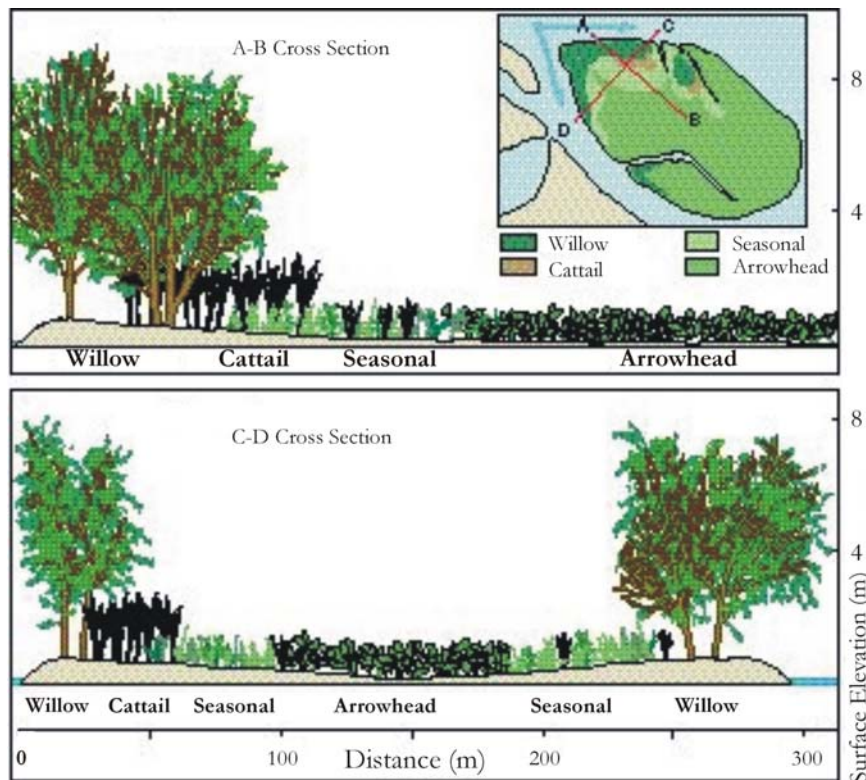
Monitoring Variables

- Habitat Mapping - 1994, 1997, 2000, and 2007.
- Vegetation - Species composition and relative abundance - 1998, 2000, 2007, and 2016.
- Elevations of disposal areas - 1998, 2000, 2002, 2007, 2016.
- Bathymetry - 2000, 2002, 2007, and 2016.
- SAV - 1998, 2000, 2007, and 2016.

Physical Response



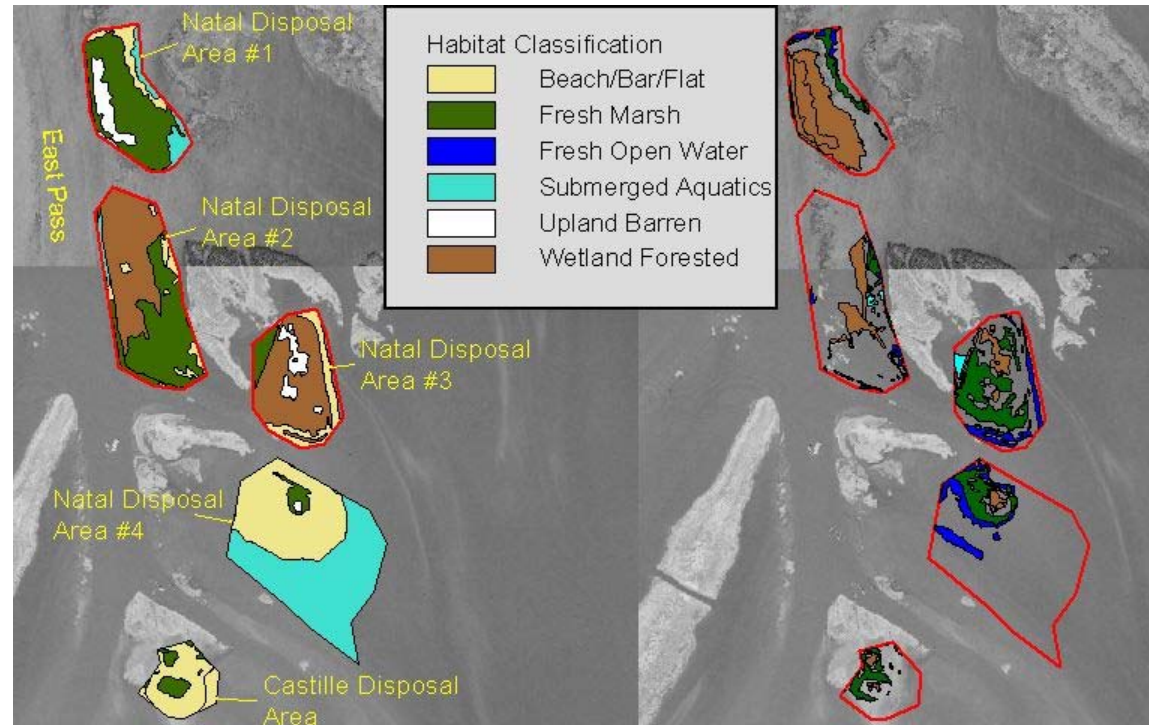
Biological Response



Johnson et. al. 1985

- Vegetation communities did not show response to elevation at 1 year post-construction.
- 3 years post-construction, elevations were significantly correlated to ordination axis scores ($r^2=0.32$).
- Species composition is different than on natural lobes.

Biological Response



Habitat type on created lobes one growing season after dredging (1998, left) and habitat conversion three growing seasons after dredging (2000, right).

Project Adaptive Management

- Implemented Changes
 - Project benchmark elevation discrepancies have been corrected.

Project Adaptive Management

- Recommended Improvements
 - Appears that shoaling is occurring at the head of Natal Channel. Maintenance dredging of Natal Channel to -10 NGVD.

Lessons Learned for Future Projects

- Incorporated in the CWPPRA process
 - Hydrologic Modeling of project area.
 - Incorporation of more intensive, and accurate pre- and post-construction surveys.
 - Develop well defined project targets.
 - Closer examination of project conceptual goals and verify the projected areas to be created.
 - Closer project inspection.
- Recommended for incorporation
 - Postpone post-construction habitat mapping until after the dredge material has settled. Allows for more reliable comparisons between constructed and natural islands.
 - Conduct topographic and bathymetric surveys “as-built” surveys immediately post-construction.