

August 3, 2011

Louisiana's Perspective: Coastal Restoration and LCA Overview

Bren Haase

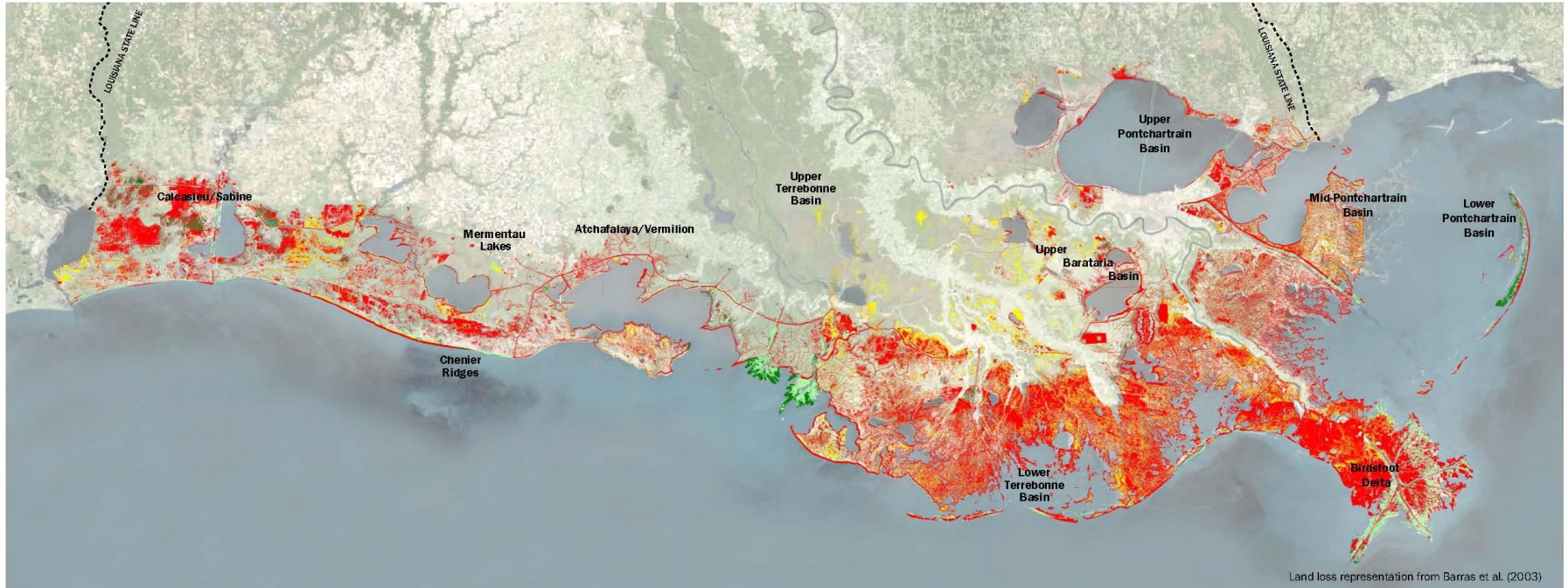
Louisiana Coastal Protection and Restoration Authority



Coastal Protection and
Restoration Authority of Louisiana



Coastal Crisis



Land loss representation from Barras et al. (2003)

Coastal Land Change 1932-2050

- Land Loss 1932 - 2000
- Potential Land Loss 2000 - 2050
- Land Gain 1932 - 2000
- Predicted Land Gain 2000 - 2050

Approximate Scale



Based on Coastal Louisiana has lost an average of 34 square miles of land, primarily marsh, per year for the last 50 years. From 1932 to 2000 coastal Louisiana has lost 1,900 square miles of land, roughly an area the size of the state of Delaware. If nothing is done to stop this land loss, Louisiana is expected to lose another 700 square miles of land, or about equal to the size of the great Washington D.C.-Baltimore area, in the next 50 years. Further, Louisiana accounted for an estimated 90 percent of the coastal marsh loss in the lower 48 states during the 1990s.

Source: Barras et al., 2003

Future Land Change (2050)



Early Evolution

Flood Control Act of 1965

- Caernarvon Freshwater Diversion
- Davis Pond Freshwater Diversion

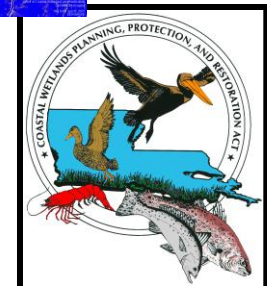
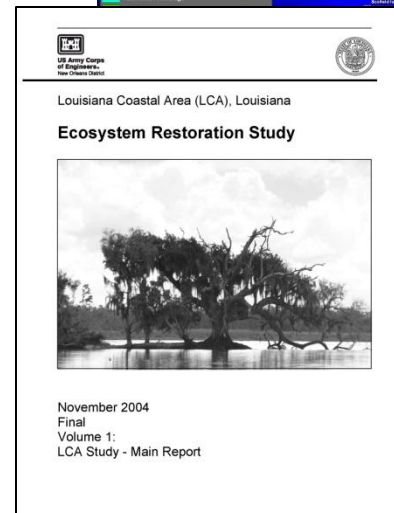
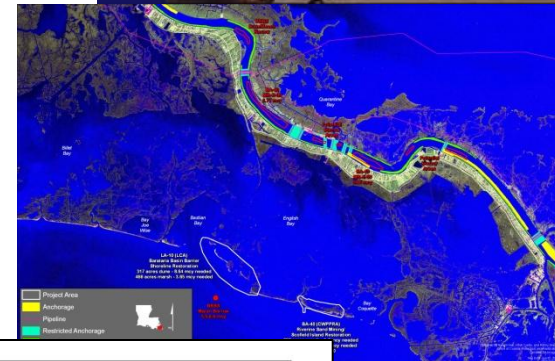
CWPPRA 1990

- Multiple small scale projects

LCA 2004/WRDA 2007

- Large scale, Near-term critical

CIAP, Surplus \$



Katrina and Rita

199 mi² lost in 2 days, 13 years worth of coastal land loss



Land Area Change in Coastal Louisiana: A Multidecadal Perspective (from 1956 to 2006)

By John A. Barnes, Julie C. Bernier, and Robert A. Moran

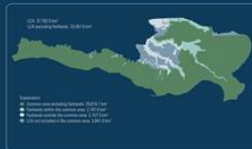


Figure 1. Map of common study area composed of overlapping data coverage in the 1956 and 1976 land and water data sets and those of the 2000 Landsat Thematic Mapper data set used in the Louisiana Coastal Area (LCA) Study (Barnes and others, 2003). Also shown are fastlands, which are excluded from calculations of net changes in land area.

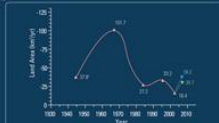


Figure 2. Annual rates of land area change in coastal Louisiana, 1956-2006.

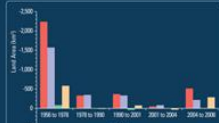


Figure 3. Net land area change by period and province, 1956-2006.

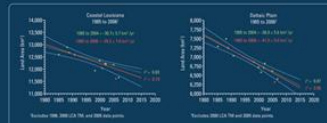


Figure 4. Linear regressions of land area change trends in coastal Louisiana by physiographic province, 1956-2006. (Negative measurements indicate land loss, while positive measurements indicate land gain.)

Explanation

- 1956 to 1976 land loss
- 1976 to 1990 land loss
- 1990 to 2000 land loss
- 2000 to 2006 land loss
- 2005 to 2006: new water areas
- 1956 to 1976 land gain
- 1976 to 1990 land gain
- 1990 to 2000 land gain
- 2000 to 2006 land gain
- 2004 to 2006: new land areas
- 2005 land
- 2006 water
- Fastlands: Agricultural, developed, and riparian areas that are generally considered nonwetlands (Barnes, 2008) and that are excluded from calculations of net land area change.
- Portions of the Louisiana Coastal Area (LCA) Study not included in the 1956 boundary of data coverage
- 2005 Katrina tracks
- Physiographic province boundary: These boundaries include the shared area between the physiographic provinces, the historical habitat data sets, and the boundary of the LCA Study (Barnes, 2008).



Image Source: Landsat Thematic Mapper satellite imagery is provided by the USGS Center for Earth Resources Observation and Science (EROS). The background land-water image depicts data from October 28, November 26, and December 18, 2006, and January 25, 2007, that is classified by types of land and water coverage.

Suggested citation: Barnes, J.A., Bernier, J.C., and Moran, R.A., 2008. Land area change in coastal Louisiana: A multidecadal perspective from 1956 to 2006. U.S. Geological Survey Scientific Investigations Map 2619, scale 1:500,000, 14 p. pamphlet. See pamphlet for references cited.

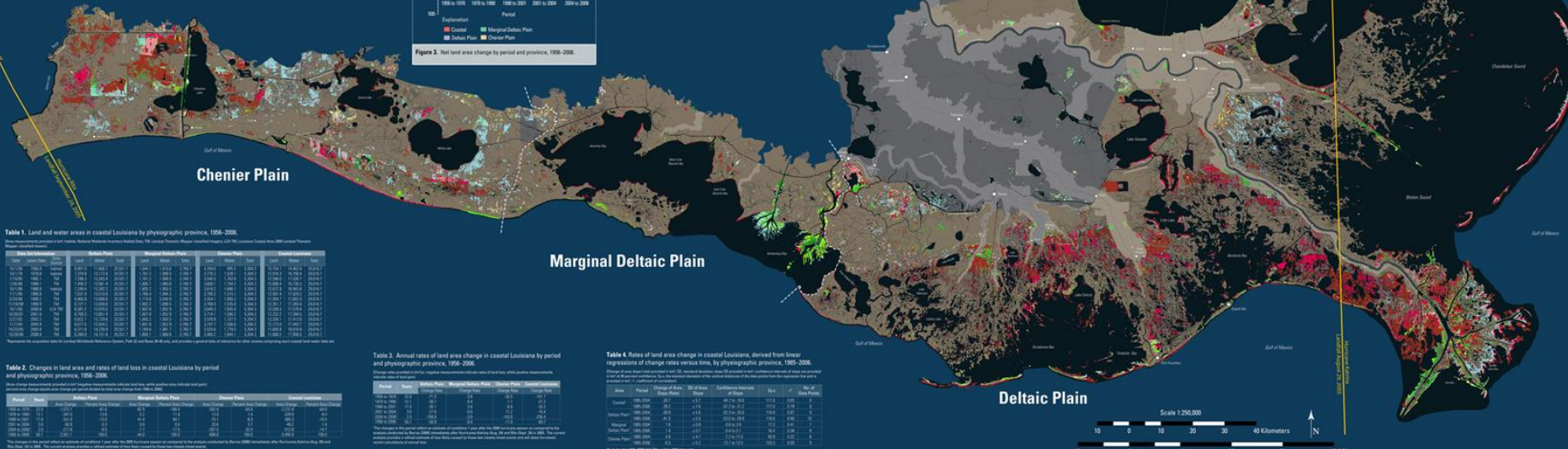


Table 1. Land and water areas in coastal Louisiana by physiographic province, 1956-2006.

Measurements are provided in total, Coastal, Marginal Deltaic Plain, Deltaic Plain, and Chenier Plain. The Louisiana Coastal Area (LCA) Study boundary is shown in black. The 1956 boundary of data coverage is shown in gray. The 2005 boundary of data coverage is shown in white. The 2006 boundary of data coverage is shown in light gray. The 2007 boundary of data coverage is shown in dark gray. The 2008 boundary of data coverage is shown in black.

Province	Period	Land		Water		Fastlands	
		Area (mi²)	Change (mi²)	Area (mi²)	Change (mi²)	Area (mi²)	Change (mi²)
Chenier Plain	1956-1976	1,100	-100	1,000	0	1,000	0
	1976-1990	1,100	-100	1,000	0	1,000	0
	1990-2000	1,100	-100	1,000	0	1,000	0
	2000-2006	1,100	-100	1,000	0	1,000	0
Marginal Deltaic Plain	1956-1976	1,100	-100	1,000	0	1,000	0
	1976-1990	1,100	-100	1,000	0	1,000	0
	1990-2000	1,100	-100	1,000	0	1,000	0
	2000-2006	1,100	-100	1,000	0	1,000	0
Deltaic Plain	1956-1976	1,100	-100	1,000	0	1,000	0
	1976-1990	1,100	-100	1,000	0	1,000	0
	1990-2000	1,100	-100	1,000	0	1,000	0
	2000-2006	1,100	-100	1,000	0	1,000	0

Table 2. Changes in land area and rates of land loss in coastal Louisiana by period and physiographic province, 1956-2006.

Province	Period	Land Area Change (mi²)		Land Loss Rate (mi²/yr)	
		Change	Rate	Change	Rate
Chenier Plain	1956-1976	-100	-0.001	-100	-0.001
	1976-1990	-100	-0.001	-100	-0.001
	1990-2000	-100	-0.001	-100	-0.001
	2000-2006	-100	-0.001	-100	-0.001
Marginal Deltaic Plain	1956-1976	-100	-0.001	-100	-0.001
	1976-1990	-100	-0.001	-100	-0.001
	1990-2000	-100	-0.001	-100	-0.001
	2000-2006	-100	-0.001	-100	-0.001
Deltaic Plain	1956-1976	-100	-0.001	-100	-0.001
	1976-1990	-100	-0.001	-100	-0.001
	1990-2000	-100	-0.001	-100	-0.001
	2000-2006	-100	-0.001	-100	-0.001

Table 3. Annual rates of land area change in coastal Louisiana by period and physiographic province, 1956-2006.

Province	Period	Annual Rate of Land Area Change (mi²/yr)	
		Change	Rate
Chenier Plain	1956-1976	-0.001	-0.001
	1976-1990	-0.001	-0.001
	1990-2000	-0.001	-0.001
	2000-2006	-0.001	-0.001
Marginal Deltaic Plain	1956-1976	-0.001	-0.001
	1976-1990	-0.001	-0.001
	1990-2000	-0.001	-0.001
	2000-2006	-0.001	-0.001
Deltaic Plain	1956-1976	-0.001	-0.001
	1976-1990	-0.001	-0.001
	1990-2000	-0.001	-0.001
	2000-2006	-0.001	-0.001

Table 4. Rates of land area change in coastal Louisiana, derived from linear regressions of change rates versus time, by physiographic province, 1956-2006.

Province	Period	Rate of Land Area Change (mi²/yr)	
		Change	Rate
Chenier Plain	1956-1976	-0.001	-0.001
	1976-1990	-0.001	-0.001
	1990-2000	-0.001	-0.001
	2000-2006	-0.001	-0.001
Marginal Deltaic Plain	1956-1976	-0.001	-0.001
	1976-1990	-0.001	-0.001
	1990-2000	-0.001	-0.001
	2000-2006	-0.001	-0.001
Deltaic Plain	1956-1976	-0.001	-0.001
	1976-1990	-0.001	-0.001
	1990-2000	-0.001	-0.001
	2000-2006	-0.001	-0.001

Master Plan 2007

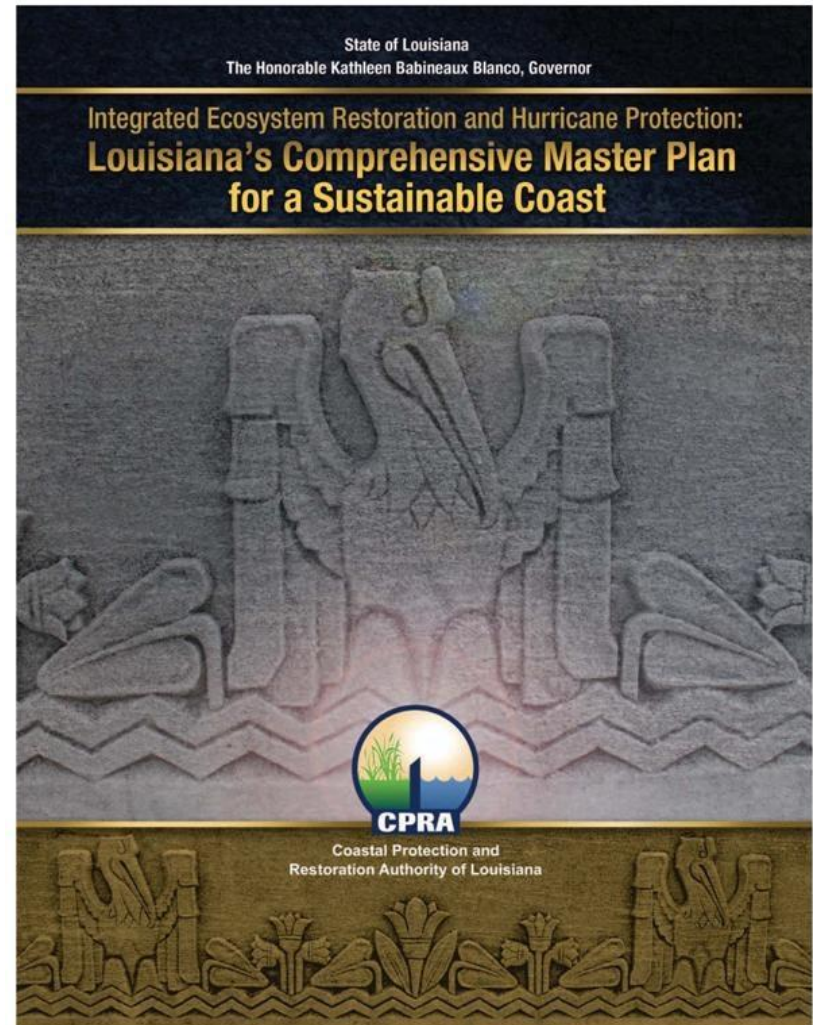
Set goals

- Reduce economic losses
- Sustainable coastal ecosystem
- Habitats to support commercial and recreational activities
- Sustain unique heritage and culture

Conceptual vision

Integrate flood risk reduction
and coastal restoration

Living document




Master Plan 2012

Comprehensive systems approach

What do we want to achieve?

How do we get there? – Projects

Under what circumstances? – Funding, Sea level rise

- **Vision**
 - **Decision Criteria, Constraints, and Uncertainties**
 - **Comprehensive Project-effects Models**
 - **Prioritization Tool**
 - **Prioritized Project Portfolios**
 - **Expected Outcomes**
 - **Adaptive Management and Implementation Plan**
 - **Long-term Funding Scenarios**
- 
- A silhouette of a coastline is visible in the background of the dark blue box. It shows a person standing on a hill overlooking the sea, with various landmasses and islands to the right.

Builds on Other Efforts

2012 CPRA Master Plan

Ongoing State/Federal Planning Efforts

- Miss. River Delta Management
- MRGO Ecosystem Restoration
- Southwest Coastal Study
- Donaldsonville to the Gulf
- Morganza to the Gulf
- LCA (15 Projects)
- CWPPRA (139 Projects)

Other Initiatives

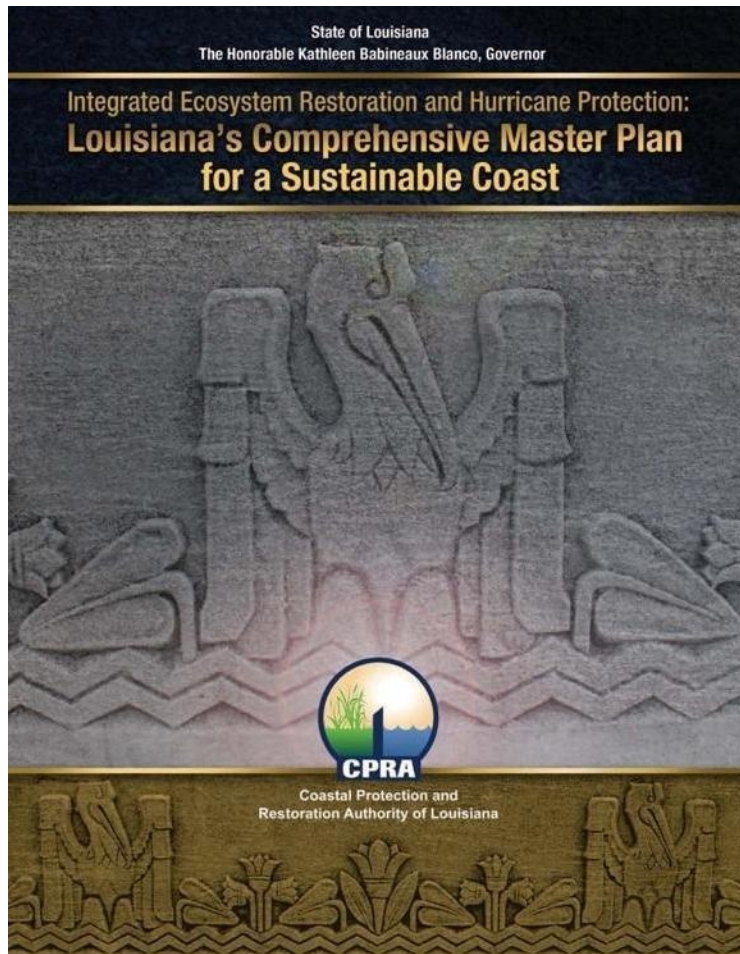
- Coastal Sustainability Studio
- Dutch Perspective
- LA Speaks
- New Framework
- Envisioning the Future
- Drawing LA's New Map

Previous Planning Efforts

- 2007 CPRA Master Plan
- Coast 2050
- LCA
- LACPR
- Others

2012 CPRA Master Plan Update Building on Other Efforts

Links Back



1. **Reduce economic losses** from storm-based flooding
2. Promote a **sustainable coastal ecosystem** by harnessing natural system processes
3. Provide habitats suitable to **support** an array of commercial and recreational **activities coast-wide**
4. Sustain Louisiana's unique **heritage and culture**
5. Provide a **viable working coast** to **support industry.**

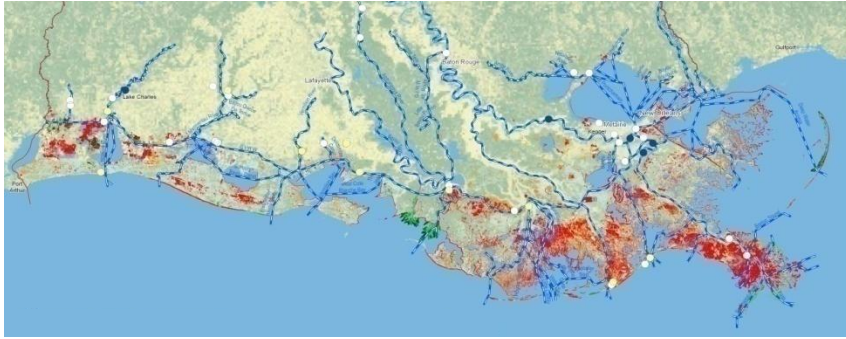
Concepts and Broad Strategies



Implementation and Expected Outcomes

Planning Framework

Future without action



A sustainable future



- Severe land loss
- Increasing hurricane flood risk
- Loss of ecosystem services
- Loss of cultural heritage
- Reactive expenditures

- Sustainable coastline & ecosystems
- Resilient communities and assets
- Long-term cost savings through strategic investments

How do we get there?

What should we do now?

How can we adapt to evolving uncertainties and improved information?

What tradeoffs remain?

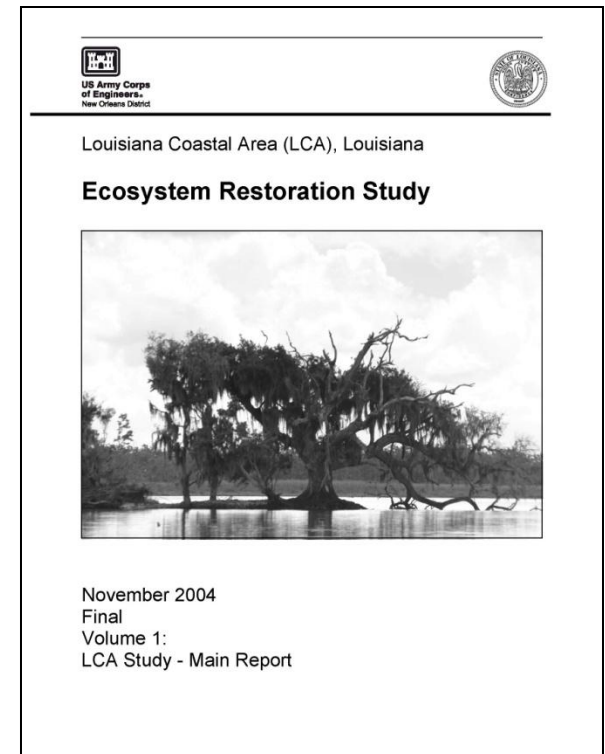
2012 Master Plan Outputs

- Maps showing ranges of Master Plan outcomes
 - Levels of flood protection
 - Levels of ecosystem services
 - Extent and character of landscape
- Adaptive management plan to guide implementation
 - Maps of near-term projects
 - Maps of potential future project
 - Schedule
 - Costs
 - Expected sources of funding



LCA How does LCA fit?

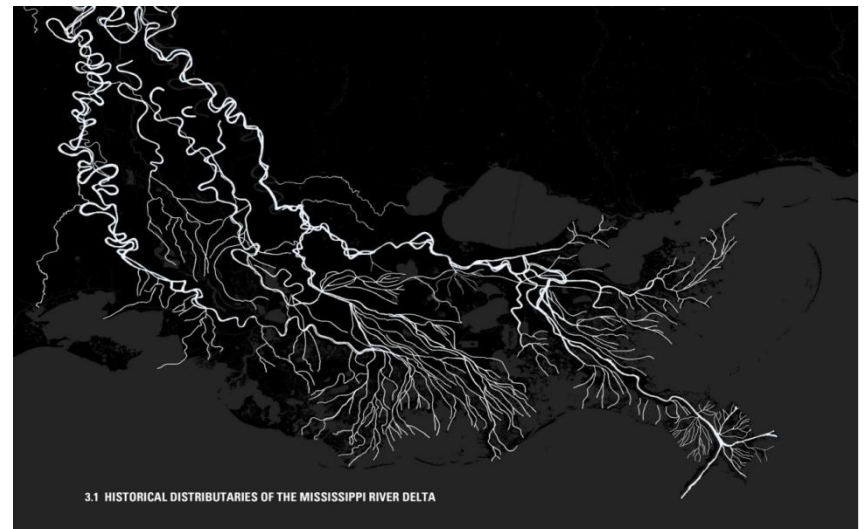
- Integral part of State's overall program
- First landscape scale projects
- Imperative to preserve future opportunity
- Largest in scale and \$
- Complicated



LCA Challenges

State technical lead on USACE projects

- Learning curve
- Collaboration
- Buy off by USACE
- Capacity



LCA Challenges

Schedule

- Compressed timeframe
- Similar process/requirements
- Stakeholder/agency priorities
- Contract execution
- Dynamic existing condition



LCA Challenges

Legal/Policy

- Implementation guidance
- Legal Interpretation/agreements
- Mid-course changes
- Crediting – when, how, what?
- Other funding sources

LCA Success

- Schedule met
- Building partnership
- Improved communication
- Conflict resolution process
- Moving out on additional efforts



Questions?

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www.coastalmasterplan.gov
www.lca.gov

