Louisiana Coastal Area
Barataria Basin Barrier Shoreline Restoration Study

Presentation to the
Civil Works Review Board
22 March 2012

COL Edward R. Fleming
District Commander
New Orleans District
US Army Corps of Engineers

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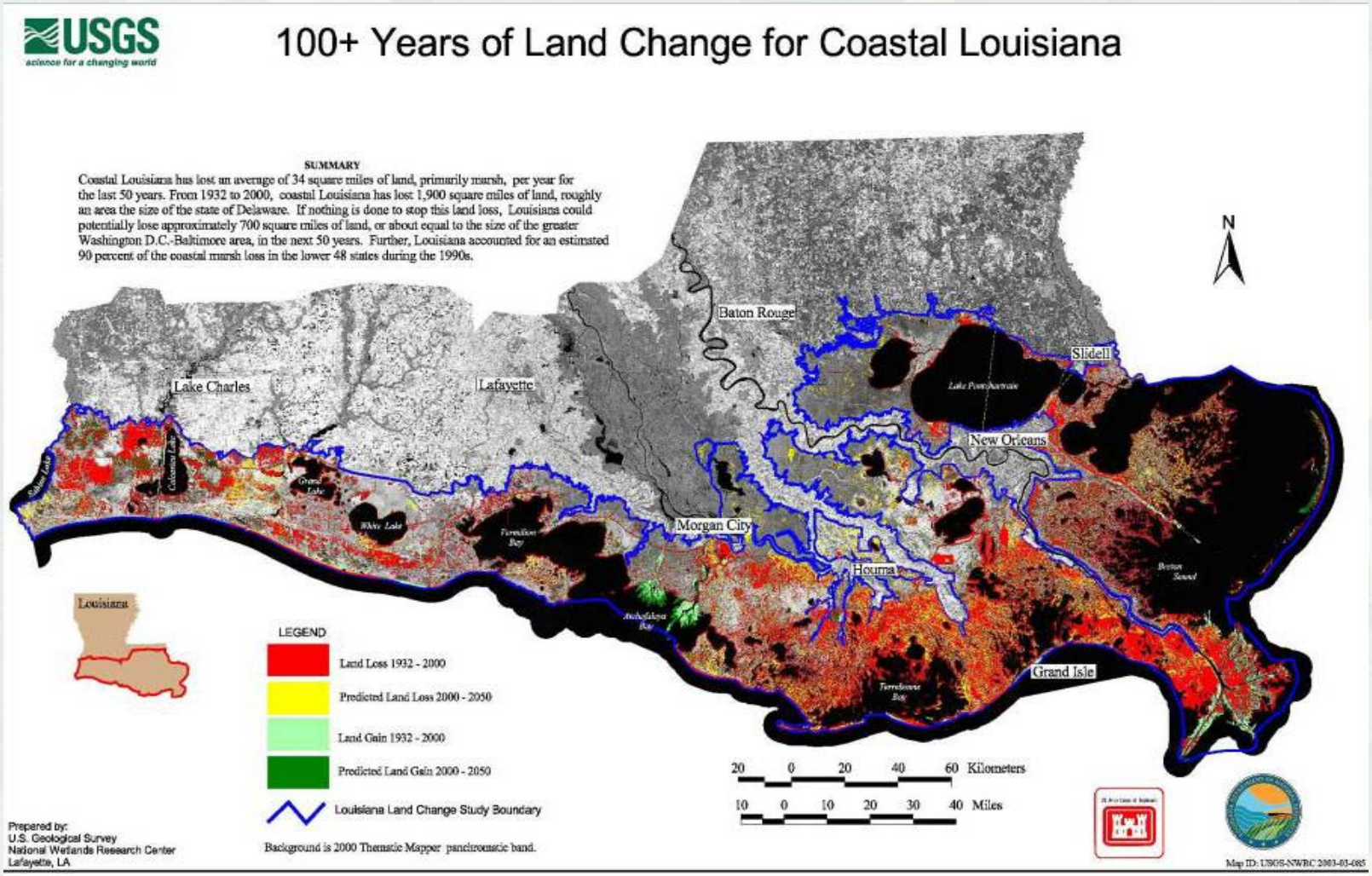
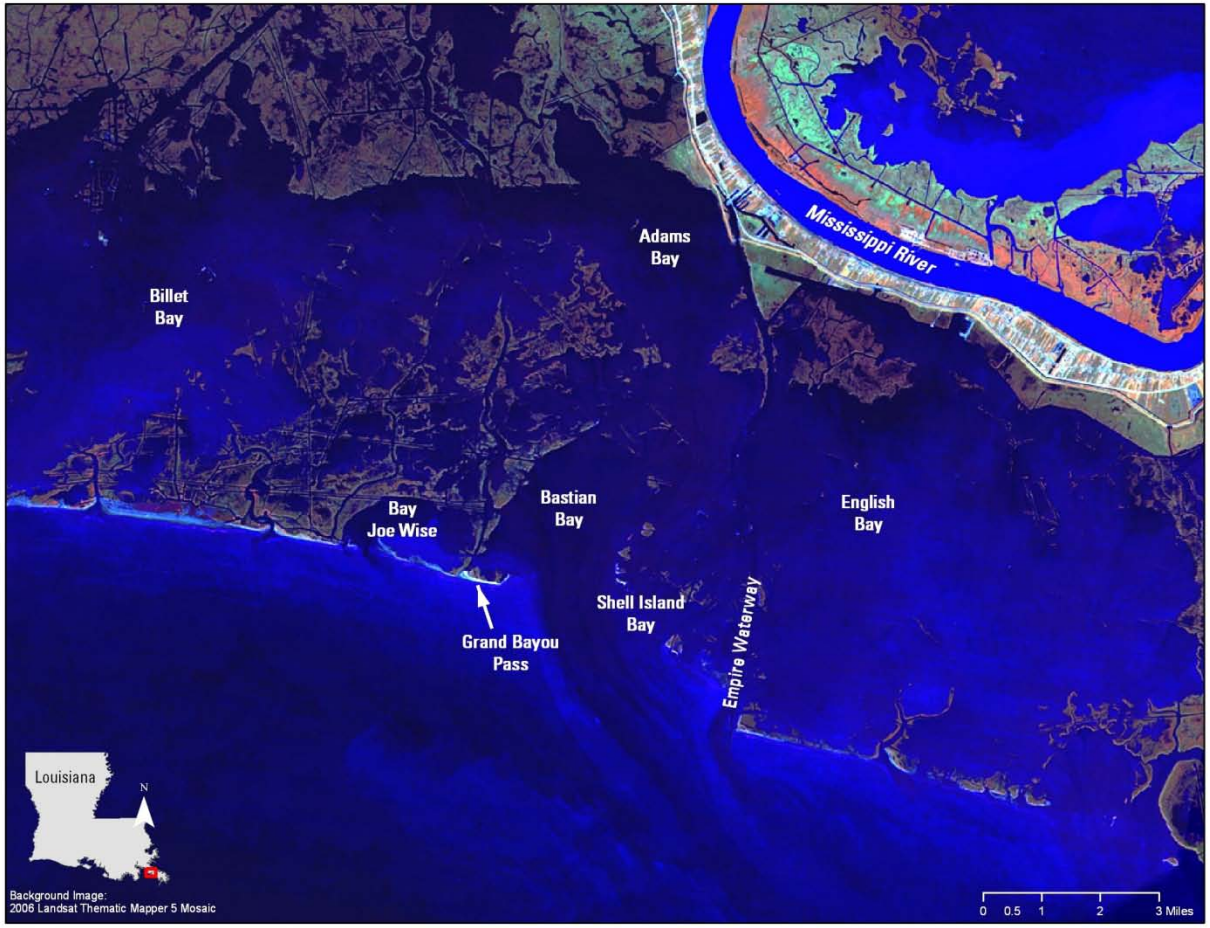
Need for Action



Breach on the Caminada Headland

Disappearance of Shell Island



Bottom Line Up Front

- Request approval from this Board to release report for State & Agency review.
- Recommended Plan exceeds WRDA 2007 authorization.
- Recommend requesting authorization to raise the total project cost to implement the recommended plan.
- Additional recommendation that a subset of the Recommended Plan be implemented under existing authority.
- First costs of Recommended Plan $428 Million.

Louisiana Coastal Area (LCA) Program

- Goal of the program is to slow the current trend of coast-wide wetland loss and resource degradation.
- Systematic approach involving larger projects to restore natural structures and processes.
- LCA program promotes the use of multiple restoration tools.
  - River diversions
  - Barrier island restoration
  - Marsh creation

LCA Chronology

1998	**Coast 2050 *Plan completed under Coastal Wetlands Planning, Protection & Restoration Act (CWPPRA).***
1999	**Coast 2050 *Plan adopted as 905b report to start Louisiana Coastal Area (LCA) feasibility study.***
2001	***LCA feasibility study approach modified to consider comprehensive coast-wide restoration plan.***
2004	**Administration provides guidance to shift focus to identify a "Near-term" LCA restoration plan.**
2004	**Final LCA plan report recommends 15 critical near-term projects – 5 for conditional authorization & 10 for further study prior to authorization.**
2005	**LCA Chief of Engineers Report signed on January 2005.**
2007	**Water Resources Development Act (WRDA) of 2007 conditionally authorizes all 15 critical near-term projects in three groups of 5, 6, & 4 subject to varying report requirements and deadlines.**
2010	**LCA WRDA Section 7006(e)(3) report submission.**
2012	**LCA BBBS report submission.**

Project Delivery Team Members

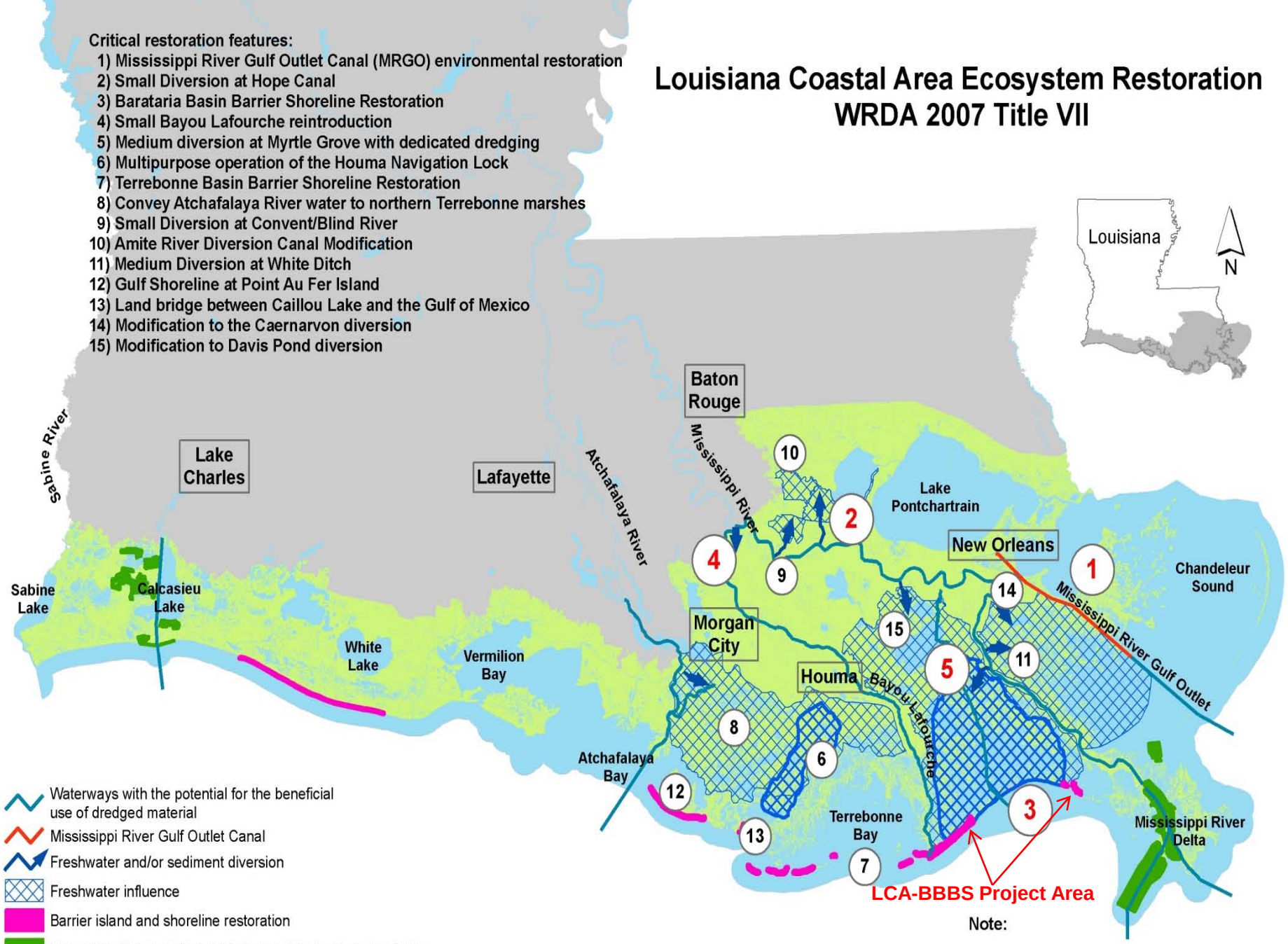
- Multi-Disciplinary and Multi-Agency Team
- USACE New Orleans District
- NFS: Louisiana Coastal Protection and Restoration Authority (LaCPRA)

Study Authority

- Water Resource Development Act (WRDA) of 2007, Title VII authorizes the Louisiana Coastal Area program.
- Section 7006 (c)(1)(C) authorizes construction of the BBBS project in accordance with the January 2005 Report of the Chief of Engineers.
- A construction report is required to document any modifications to the Chief's Report.
- Secretary of the Army must approve and submit the report to Congressional Committees.
- Section 7006(c)(4) limits the cost to 150% of the authorized total cost.

Louisiana Coastal Area Ecosystem Restoration
WRDA 2007 Title VII

Critical restoration features:
1) Mississippi River Gulf Outlet Canal (MRGO) environmental restoration
2) Small Diversion at Hope Canal
3) Barataria Basin Barrier Shoreline Restoration
4) Small Bayou Lafourche reintroduction
5) Medium diversion at Myrtle Grove with dedicated dredging
6) Multipurpose operation of the Houma Navigation Lock
7) Terrebonne Basin Barrier Shoreline Restoration
8) Convey Atchafalaya River water to northern Terrebonne marshes
9) Small Diversion at Convent/Blind River
10) Amite River Diversion Canal Modification
11) Medium Diversion at White Ditch
12) Gulf Shoreline at Point Au Fer Island
13) Land bridge between Caillou Lake and the Gulf of Mexico
14) Modification to the Caernarvon diversion
15) Modification to Davis Pond diversion



Note:

Critical features 1-5 contingently authorized
Critical features 6-15 conditionally authorized

Project Location

- Coastline of the Barataria Basin
  - Situated between the Mississippi River and Bayou Lafourche.
  - Plaquemines, Lafourche, and Jefferson Parishes.
- Caminada Headland and Shell Island were identified as critical near-term restoration needs for the basin in the 2004 LCA report.

Project Purpose

The project is single purpose aquatic ecosystem restoration, to restore the Barataria Basin barrier shoreline to ensure the continuing geomorphic and hydrologic form and function of the areas.

Problems

- Erosion of geomorphic structure and hydrologic function of barrier shoreline systems threatens conversion of the estuarine system .
- Loss of critical barrier island/headland ecosystem habitat.
- Interior basin wetlands and adjacent infrastructure and development are impacted by increasing salinity, tidal flux, wave action and storms.
- Reduced sediment availability and longshore transport significantly limits ecosystem sustainability.

Objectives

- Restore the barrier shoreline structure to ensure continued geomorphological and hydrological function.
- Reduce shoreline loss, to prevent the dissolution of Caminada Headland into separate barrier islands, and the loss of Shell Island.
- Increase and protect acreage of shoreline, dune, and interior marsh and chenier ridge habitats for essential fish and wildlife species.
- Regulate system change within the Barataria estuary and allow opportunity for future restoration
- Increase sediment input to supplement long-shore sediment transport processes along the gulf shoreline.

Project Needs and Considerations

- Preservation of critical and essential geomorphic structures of the Barataria barrier system.
- Future land loss, habitat loss, and fragmentation of the land features will result in diminishing habitats for T&E species.
- The estuarine environments are being adversely impacted by the high energy marine processes and the associated salinity of the Gulf of Mexico.
- Vital local, regional, and national socio-economic resources are in danger of being lost.
- Near-term restoration should be synergistic with future restoration by maintaining or restoring the integrity of Louisiana's coastline, upon which all future coastal restoration is dependent.

Future Without Project Conditions: Caminada Headland

- Splintering of the headland into 3 islands.
- Estimated loss of all but 34 acres over the 50 year period of analysis.
- Loss of the only chenier ridges in the Deltaic Plain.
- Loss of critical habitat for T&E species.
- Increased storm impact on critical oil and gas infrastructure and production.

Future Without Project Conditions: Shell Island

- Loss of Shell Island over the next 20 years.
- Loss of skeletal framework on which to build a viable barrier system.
- Complete loss of geomorphic and hydrologic form and function that regulates extention of the Gulf of Mexico into the interior bays and marshes.
- Conversion of estuarine conditions, salinity regimes, and critical/essential habitat.
- Exposure of nationally significant infrastructure and navigation to direct attack from storms

Measures Considered

Shoreline Restoration

- Sand Shoreline Restoration
- Rock Shoreline
- Groins And Breakwaters
- Modify Belle Pass Jetties
- Modify Empire Jetties
- Sand Bypass System
- Feeder Shorelines
- Sand Fencing
- Dune Fields
- Dune Plantings

Marsh Restoration

- Restore/Nourish Interior Marsh
- Marsh Plantings
- Plug Or Fill Pipeline Canals
- Terraces

Evaluation Array of Alternatives

- Four Caminada Headland and four Shell Island plans in the evaluation array of alternatives.
- Habitat benefits were calculated on these alternatives.
- Net benefits calculated for each alternative and compared to Future Without Project conditions.
- IWR Cost Effectiveness/Incremental Cost Analysis evaluated all possible combinations.
- Analysis resulted in five cost effective plans and two best buy plans.

Recommended Plan

- The National Ecosystem Restoration (NER) Plan/ Recommended Plan combines the Caminada Headland Alternative and the Shell Island Alternative.
- NER/Recommended Plan cost exceeds WRDA 2007 authorization.
- Recommend that the authorization be modified to raise the total project cost to allow for construction of the plan.
- Recommend construction of the Caminada Headland reach under the existing authority.
  - Cost effective and incrementally justified.
  - Within scope and cost of WRDA authorization.
  - Implementable and separable increment of the NER Plan.

Caminada Headland

- Restores or creates 2,066 acres
  - Restores 1,431 degraded acres of habitat
  - Creates 635 acres of new habitat
- 880 acres of beach and dune
  - Dune height of +7 feet
  - Sand from Ship Shoal
  - 5.1 million cy of sediment
- 1,186 acres of marsh
  - Marsh elevation of +2 feet
  - Material from offshore near the headland
  - 5.36 million cy of sediment

Caminada Headland

- Operations and Maintenance includes placement of 3.9 million cy of material every 10 years into the littoral drift south of the headland.
- Beneficial use of dredged material in conjunction with Bayou Lafourche navigation dredging.
- The sediment adds width to the beach, sustaining the construction benefits.

Shell Island

- Restores or creates 783 acres
  - Restores 386 degraded acres of habitat
  - Creates 397 acres of new habitat
- 317 acres of beach and dune
  - Dune height of +6 feet
  - Material from the Mississippi River
  - 5.6 million cy of sediment
- 466 acres of marsh
  - Marsh elevation of +2 feet
  - Material from offshore near the Empire Waterway
  - 2.1 million cy of sediment

Shell Island

- Operations and Maintenance includes renourishment in years 20 and 40, returning the island to its construction template.
- 1.5 million cy of beach/dune material in years 20 and 40.
- 907,200 cy in year 20 and 604,700 cy in year 40 of marsh material.

Significance of Benefits

- Decrease in wetland loss and preservation of unique and scarce barrier shoreline habitats.
- Restoration of hydrologic function.
- Maintenance of geomorphic form.
- Restoration of critical habitat for threaten or endangered species including: sea turtles, piping plover, and gulf sturgeon.

Cost Apportionment

(October 2011 Price Level)

Item	Total	Federal	Non-Federal
PED	$6,800,000	$4,420,000	$2,380,000
Construction	409,000,000	$268,255,000	$140,745,000
Lands, Easements, Rights of way	$3,700,000	$0	$3,700,000
Monitoring & Adaptive Management	$1,299,000	$844,350	$454,650
Total First Costs	$428,262,000	$278,370,300	$149,891,700

Recommended Plan Costs and Benefits

	Dune Acres Restored	Marsh Acres Restored	Total Acres Restored	Average Annual Cost[1]
Caminada Headland	880	1186	2066	$14,568,580
Shell Island	317	466	783	$12,425,478
TOTAL	1197	1652	2849	$26,994,000

[1]Avg. Annual Costs: Oct 2011 price level, 4.0 federal discount rate

Cost Apportionment: Caminada Headland Increment

(October 2011 Price Level)

Item	Total	Federal	Non-Federal
PED	$3,604,000	$2,342,600	$1,261,400
Construction	$218,271,000	$141,876,150	$76,394,850
Lands, Easements, Rights of way	$1,651,000	$0	$1,651,000
Monitoring & Adaptive Management	$630,000	$409,500	$220,500
Total First Costs (R)	$224,000,000	$146,000,000	$78,000,000

Model Certification

- Wetland Value Assessment Methodology
- Barrier Island and Barrier Island Headland community models were approved on 8 November 2011.
- WVA Coastal Marsh Community model approved 28 February 2012.

Agency Technical Review

- Review was managed by the Ecosystem Restoration Planning Center of Expertise (ECO-PCX)
  - ► Final report review
    - 29 comments
    - All resolved
    - 14 December 2011
  - ► Cost Engineering DX ATR Certification
    - 9 December 2011

Independent External Peer Review (IEPR)

- Battelle Memorial Institute subcontracted a panel of five technical experts (Civil Works planning, wetland ecology/biology, coastal engineering, hydrology/hydraulics engineering, and coastal geomorphology.)
- 16 comments: 15 medium significance, 1 low significance
- All 16 comments resolved.

Public Involvement

- May 2005: Notice of Intent (NOI) for the Draft EIS of the LCA-BBBS Study was published in the *Federal Register.*
- Scoping meetings held: June 2005.
- Public hearings held: July 2011.
- Significant conflicts or issues:
  - Socio-economic goals (recreational access and protection of national oil and gas interests)
  - Hurricane and Coastal Storm Damage Risk Reduction
  - Deepwater Horizon Oil Spill

Relative Sea Level Rise

- Project was developed in accordance with EC 1165-2-212.
- Relative Sea Level Rise (RSLR) was incorporated in the engineering models.
- Acreage was estimated for historic, intermediate, and high RSLR rates.
- Construction benefits maintained at historic and intermediate RSLR rates through renourishment.

Risk and Uncertainty

- Extreme Weather Events
  - Long term erosion rates incorporate effects of storms.
  - Minimal risk of not achieving benefits due to renourishment that can be altered through Adaptive Management.
- Model Parameters
  - Coastal systems are complex.
  - Simplifying assumptions used.
  - Sensitivity Analysis completed to determine impacts.

Lessons Learned from Past Projects

- Data from CWPPRA projects incorporated into project design.
- LCA Terrebonne Basin Barrier Shoreline Restoration OMRR&R plan utilized to help develop sustainable plan for BBBS.

Environmental Operating Principles

- Plan meets the EOP standards
  - Plan is sustainable.
  - Natural dynamism of the coastal environment is integrated into the planning process.
  - Allows for a balance between human use and protection of the natural resources.
  - Care was taken that restoration techniques would not adversely impact areas outside of the project area.
  - Restoration techniques and results from previous restoration projects have been incorporated.
  - Close PDT coordination with local municipalities, other entities, and residents within the study area.

USACE Campaign Plan

- This project delivers an enduring and essential water resource solution through collaboration with partners and stakeholders.
  - 4a -Multidisciplinary and multiagency PDTs.
  - 2b -Frequent meetings with stakeholders.
  - 2d -Enable Gulf recovery through development of a long-term sustainable coastal and ecosystem project.
  - 4c -Use of an integrated, collaborative approach to planning.
- The planning effort has built and is cultivating a competent, disciplined, and resilient team equipped to deliver high quality solutions.
  - 4b -Communicating to teams and stakeholders strategically and transparently.
  - 4b -Establishing a comprehensive LCA website.
  - 4c -Standardization of reports and business processes throughout the LCA program.

Project Implementation

Milestones:

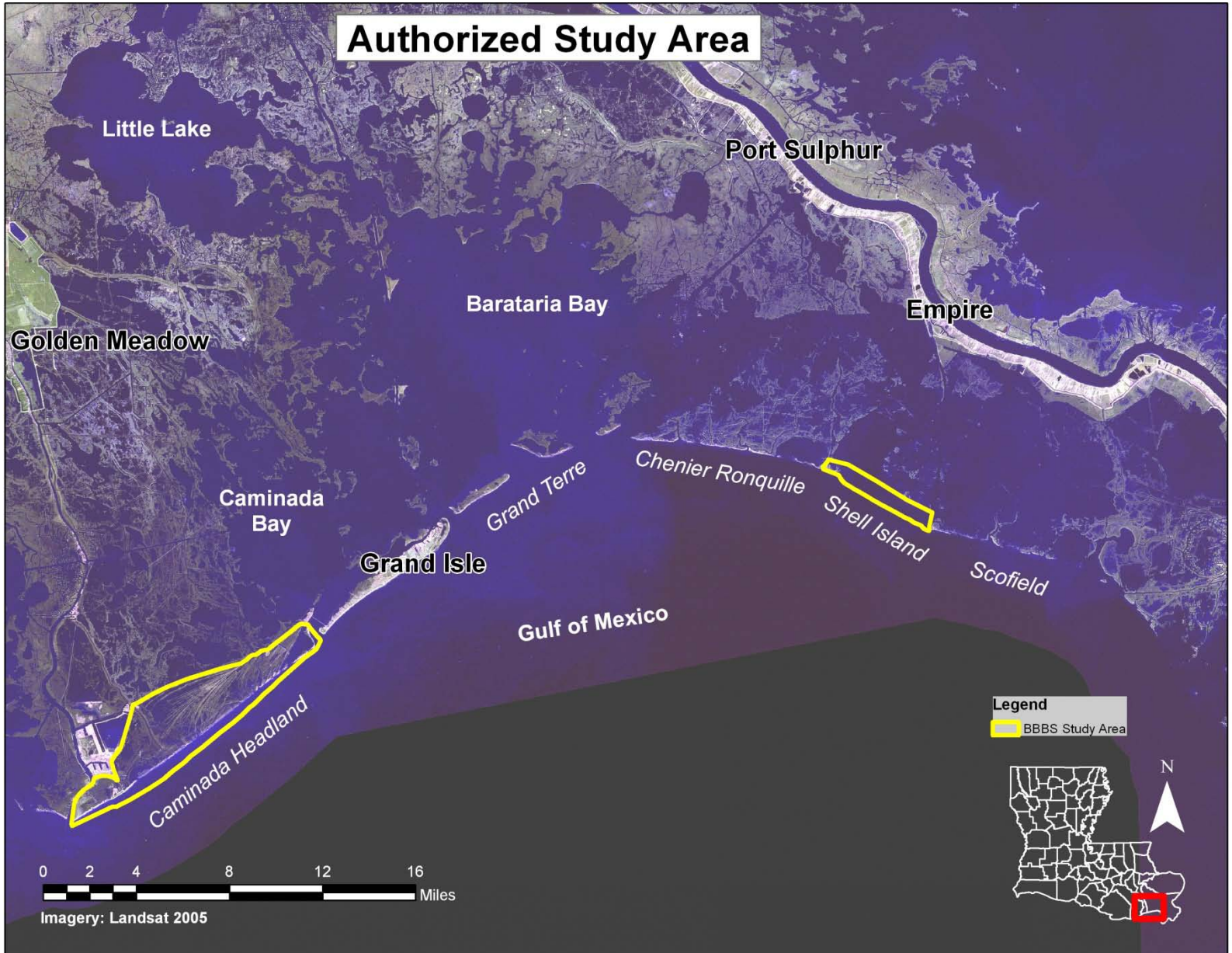
MVD Commander Signs Transmittal Letter	January 2012
Civil Works Review Board	March 2012
Public Review of Final Report and EIS	April 2012
Chief's Report	June 2012
Construction start	October 2013

Recommendation

That the Civil Works Review Board approve the release of the LCA Barataria Basin Barrier Shoreline Restoration Construction Report and Environmental Impact Statement for State and Agency Review.

Questions?

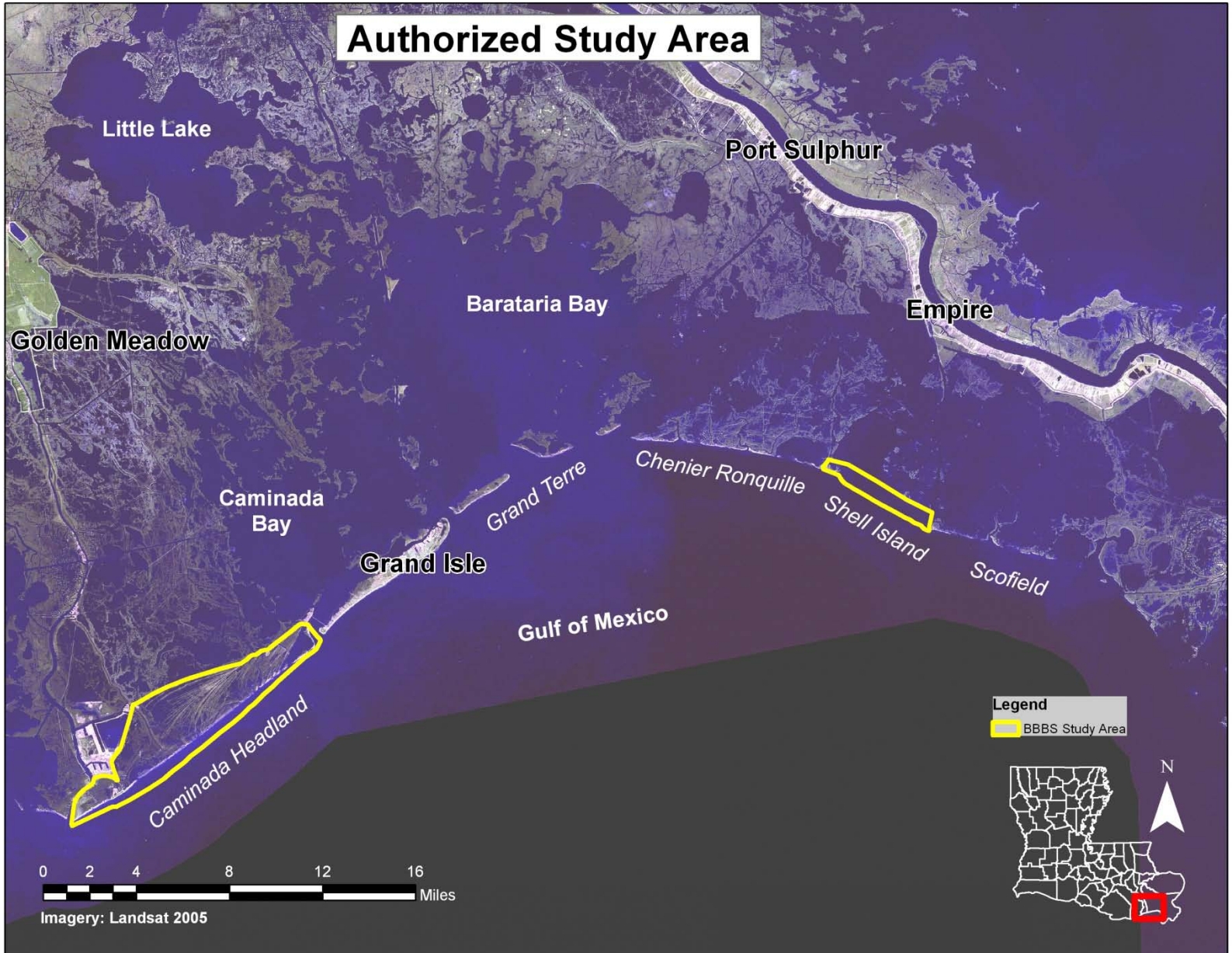
LCA Barataria Basin Barrier Shoreline



Mr. Jerome Zeringue

Executive Director, Coastal Protection and Restoration Authority, State of Louisiana

LCA Barataria Basin Barrier Shoreline



Presentation to the

CIVIL WORKS REVIEW BOARD

Louisiana Coastal Area (LCA)
Barataria Basin Barrier Shoreline Restoration Project
WRDA of 2007, Title VII, Section 7006 (c)(1)(C).

by

MG John W. Peabody

Commander
Mississippi Valley Division

March 22, 2012

US Army Corps of Engineers
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MVD Command Endorsement

- Concur with MVN Commander's findings and recommendations for LCA Barataria Basin Barrier Shoreline Restoration Project.
- Report complies with all applicable policies and laws in place at this time.
- Anticipate a favorable response to the draft Chief's Report.
- Plan supported by sponsor and Congressional delegation.
- Consistent with the Environmental Operating Principles.

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Certification of Legal and Policy Compliance

- Legal certification dated January 5, 2012.
- Technical and policy compliance:
  - ATR performed by staff from SAD and NWD.
  - All ATR comments resolved and certification dated December 14, 2011.

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MVD Quality Assurance Activities

- MVD reviewed ATR comments/responses to ensure appropriate resolution.
- Active participation by vertical team.
- Worked with MVN to resolve HQ review comments.
- MVD concurs that project is technically sound and policy compliant.
- Conforms with WRDA 2007 guidance dated July 10, 2009.

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MVD Recommendations

- Approve Final Report.
- Release report for State and Agency Review.
- Complete Chief's Report NLT June 19, 2012.

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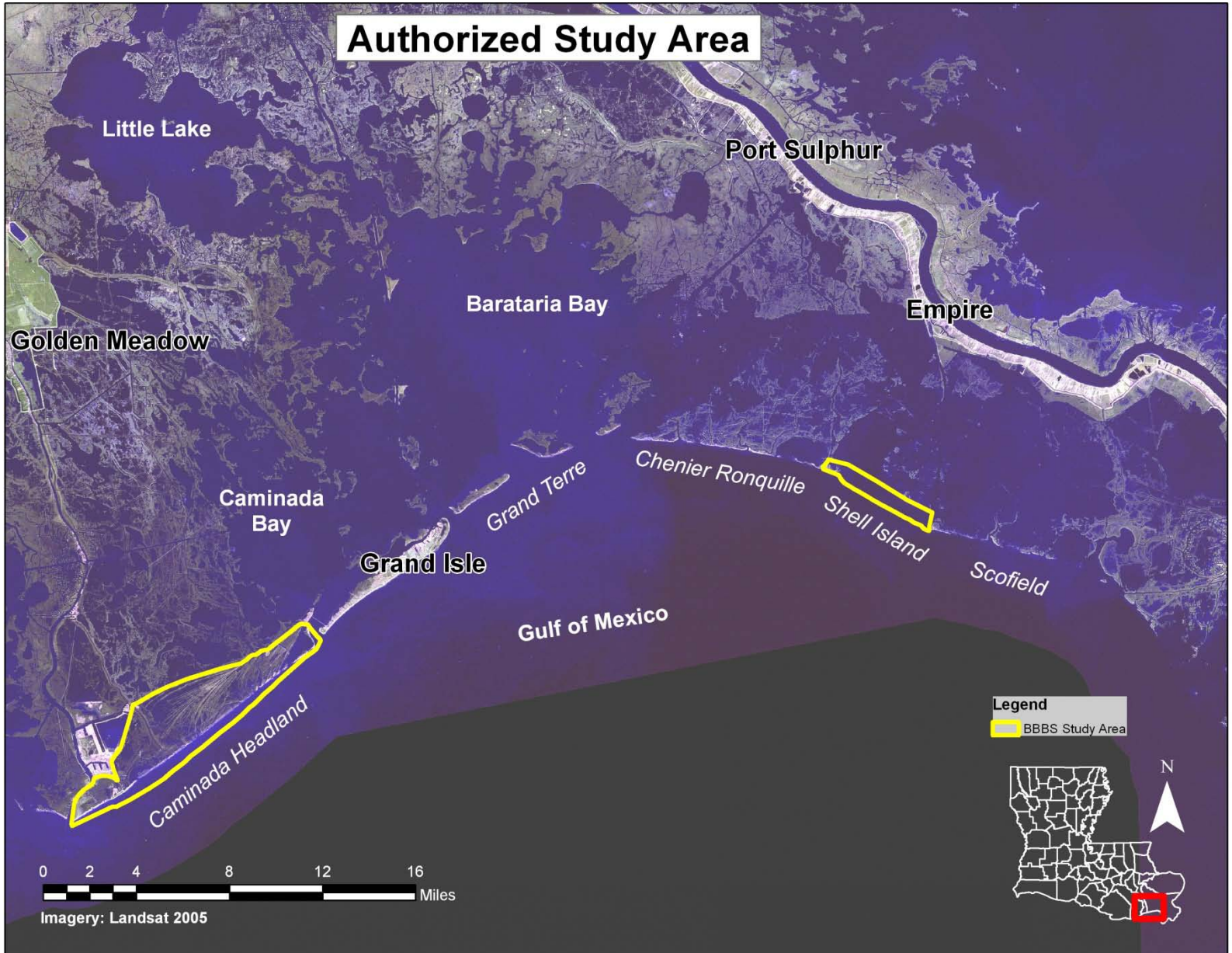
LCA Barataria Basin Barrier Shoreline



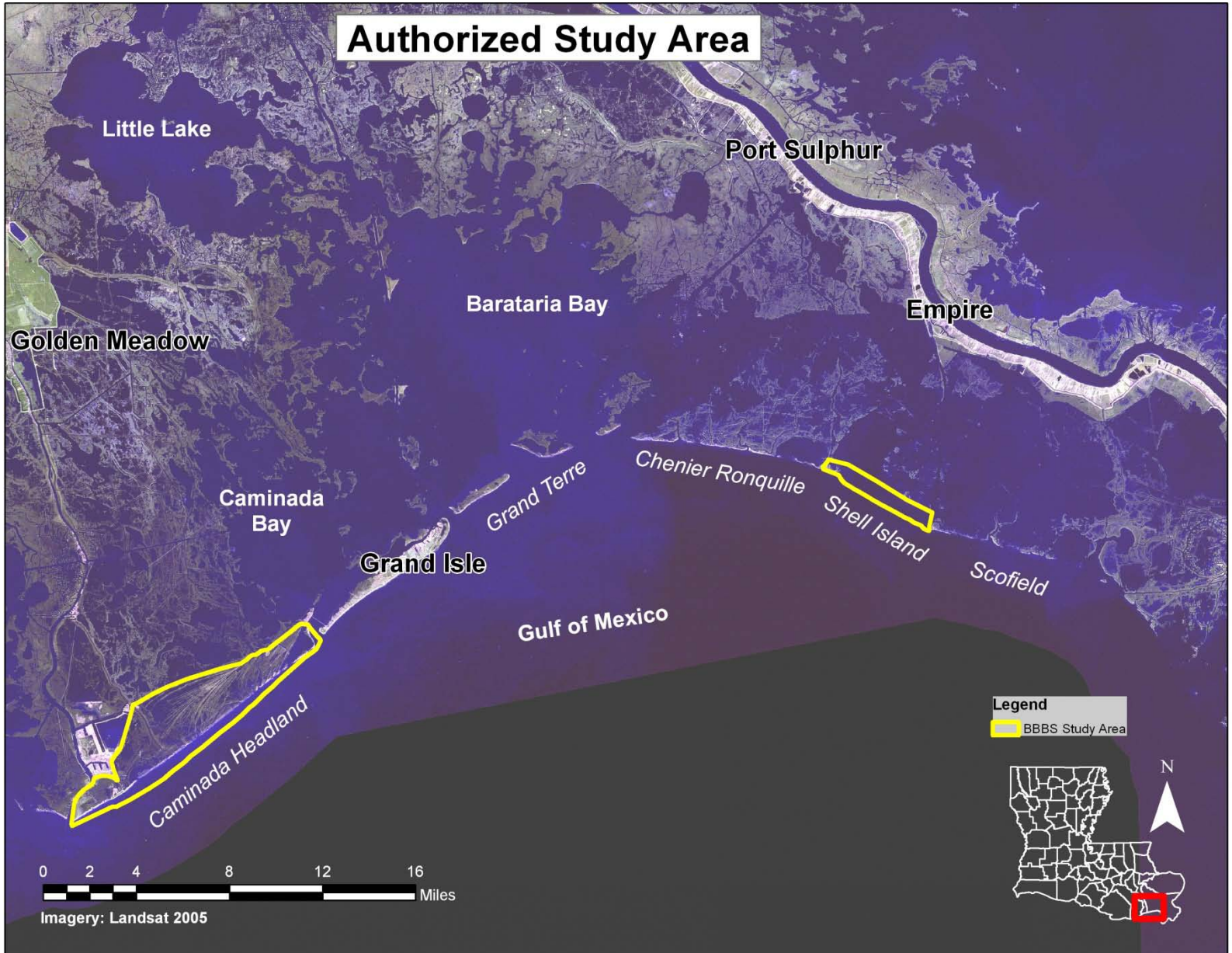
Agency Technical Review

- ATR managed by Eco-PCX
- ATR lead: James M. Baker, Planning Division, Jacksonville District
- 3 reviews:
  - Draft Report – May 2009
  - Revised Draft Report – Jan 2011
  - Final Report – Dec 2011
- 193 comments from 7 reviewers (not including cost cert review)

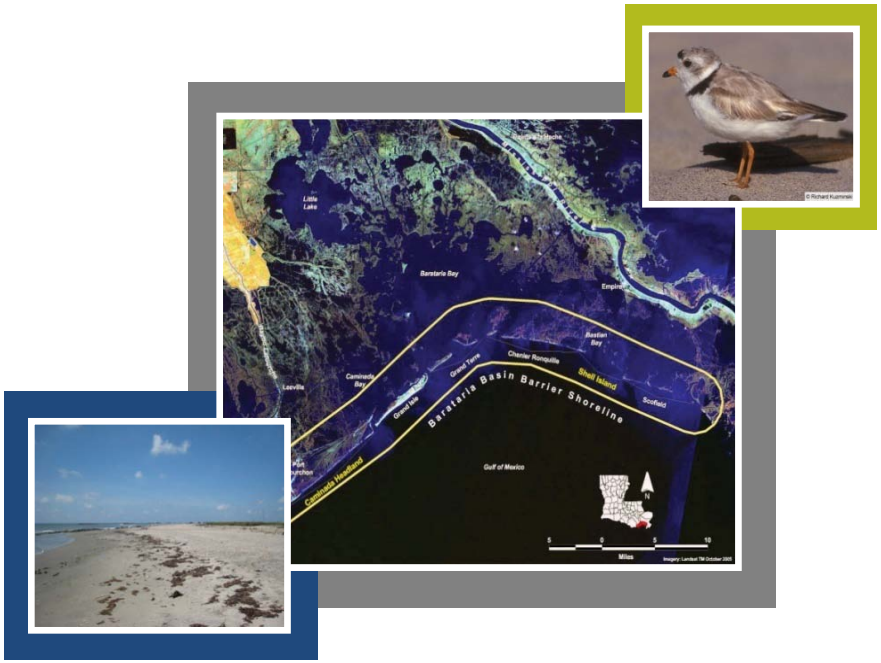
Agency Technical Review

- Prominent review concerns:
  - Uncertainty of future conditions – need for adaptive mgt (Draft Rpt)
  - Construction berm design/location (Draft Rpt)
  - Appropriateness of including real estate costs (Draft Rpt)
  - Lack of renourishment consideration (Draft Rpt)
  - Renourishment adequacy (Rev Draft Rpt)
  - WVA Ecosystem model certification (Rev Draft Rpt)
  - Verified compliance with NEPA/other environmental directives (Final Rpt)
  - Verified commitments from previous reviews (Final Rpt)
- All comments resolved

LCA Barataria Basin Barrier Shoreline



Independent External Peer Review (IEPR) – Barataria Basin Barrier Shoreline Restoration Draft Construction Report and Draft EIS



Battelle

Karen Johnson-Young, Program Manager

Corey Wisneski, Project Manager

IEPR – Barataria Basin

- The IEPR was conducted in 2011
- The IEPR was completed following the Louisiana Water Resources Council (LWRC) Charter and is in compliance with WRDA 2007, Section 7009
  - Completed by LWRC standing IEPR Panel Members
- Five experts on IEPR Panel
  - Civil Works planning – *Ken Casavant, Ph.D.*
  - Wetland ecology/biology – *Kay Crouch*
  - Coastal engineering – *Ralph Ellis, Ph.D., P.E.*
  - Hydrology/hydraulics engineering – *Brian Bledsoe, Ph.D., P.E.*
  - Coastal geomorphology – *Chris Houser, Ph.D.*

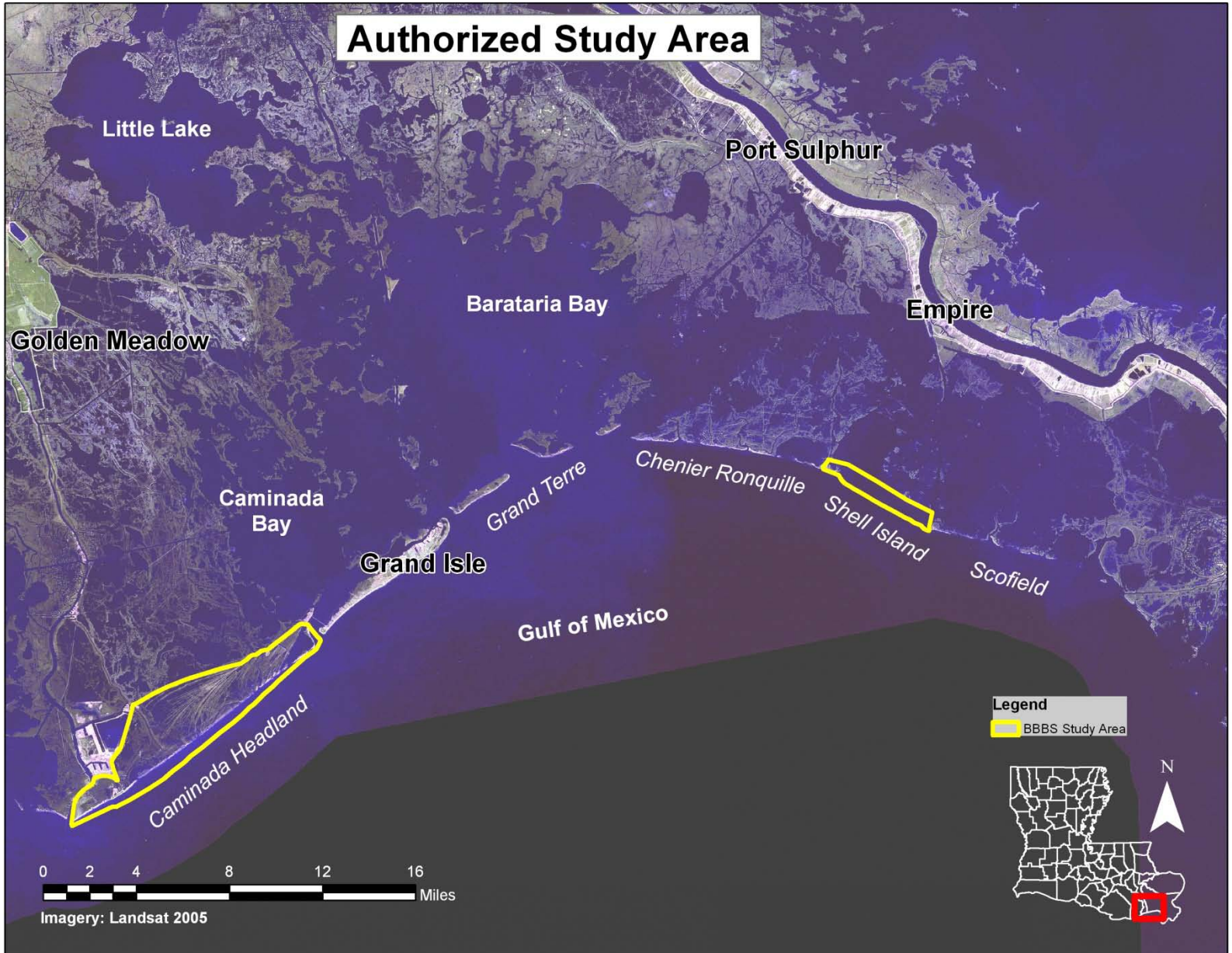
IEPR – Barataria Basin (continued)

- Final IEPR Report Submitted on October 3, 2011
- IEPR Results: 16 Final Panel Comments:15 medium significance; 1 low significance
- Comment/Response Results Documented on December 2, 2011
- USACE response to Final Panel Comments: 16 concurs, 0 non-concurs.
- Panel's response to USACE: 16 concurs, 0 non-concurs

IEPR – Barataria Basin (continued)

- Results:
  - Civil Works planning studies were complete. All issues identified in the Final Panel Comments were adequately addressed.
  - Wetland ecology/biology studies were complete. All issues identified in the Final Panel Comments were adequately addressed.
  - Coastal engineering studies were complete. All issues identified in the Final Panel Comments were adequately addressed.
  - Hydrology/hydraulic engineering studies were complete. All issues identified in the Final Panel Comments were adequately addressed.
  - Coastal geomorphology studies were complete. All issues identified in the Final Panel Comments were adequately addressed.

LCA Barataria Basin Barrier Shoreline



HQUSACE POLICY REVIEW CONCERNS

Civil Works Review Board

Barataria Basin Barrier Shoreline Ecosystem Restoration Project

Mark Matusiak
Office of Water Project Review
Planning and Policy Division
Washington, DC – 22 March 2012

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HQUSACE Team Reviews:

- Review of Draft Report completed March 2011.
- AFB was held May 2011.
- Review of Final Feasibility Report completed March 2012.

Significant Policy Comments

- OMRR& R. The AFB report did not propose any OMRR&R other than maintenance of sand fence and monitoring plan.
- Long-term sustainability of Caminada Headland component. The re-nourishment plan for the Caminada component in the draft report would replace 53% of the sand lost from the barrier island over the 50 year period of analysis.
- Non-standard estates vs. fee simple acquisition. Non-standard estates (easements) proposed in the draft report; fee simple acquisition is the preferred form of real estate interest. Not clear if easements could provide adequate interest to facilitate all needed OMRR&R actions and protect sites in long term.

OMRR&R

CONCERN: The AFB report did not include any OMRR&R other than maintenance of sand fence and monitoring plan. The 2004 LCA report and WRDA 2007 authorization called for periodic re-nourishment.

REASON: Sand is lost from the barrier islands on a continual basis, and at existing loss rates all constructed acreage would disappear within 25-30 years. Justification of Federal investment questioned by HQUSACE.

RESOLUTION: Re-nourishment proposed at draft report stage, and refined prior to final report. Renourishment plan in final report is consistent with Corps OMRR&R policies and will help ensure the long-term sustainability of the Caminada and Shell Island sites.

RESOLUTION IMPACT: Concern Resolved.

Long-term Sustainability of Caminada Island Component

CONCERN: The re-nourishment plan proposed in the draft report would replace 53% of the sand that is lost over the 50 year period of analysis.

REASON: Long-term sustainability unclear given that loss rate exceeds re-nourishment rate. Debate about geomorphic form and function as it relates to direct habitat restoration and indirect protection of valuable resources landward of barrier island.

RESOLUTION: Re-nourishment plan was refined prior to final report to replace 100% of sand lost from the system over the period of analysis. Adaptive management plan established trigger points for re-nourishment actions designed to target areas of greatest need or benefit .

RESOLUTION IMPACT: Concern Resolved.

Non-Standard Estates vs. Fee Simple Acquisition

CONCERN: Non-standard estates (easements) proposed in draft report; fee simple acquisition is preferred form of real estate interest.

REASON: It is not clear that easements could provide adequate interest to facilitate all OMRR&R and to protect sites in long term.

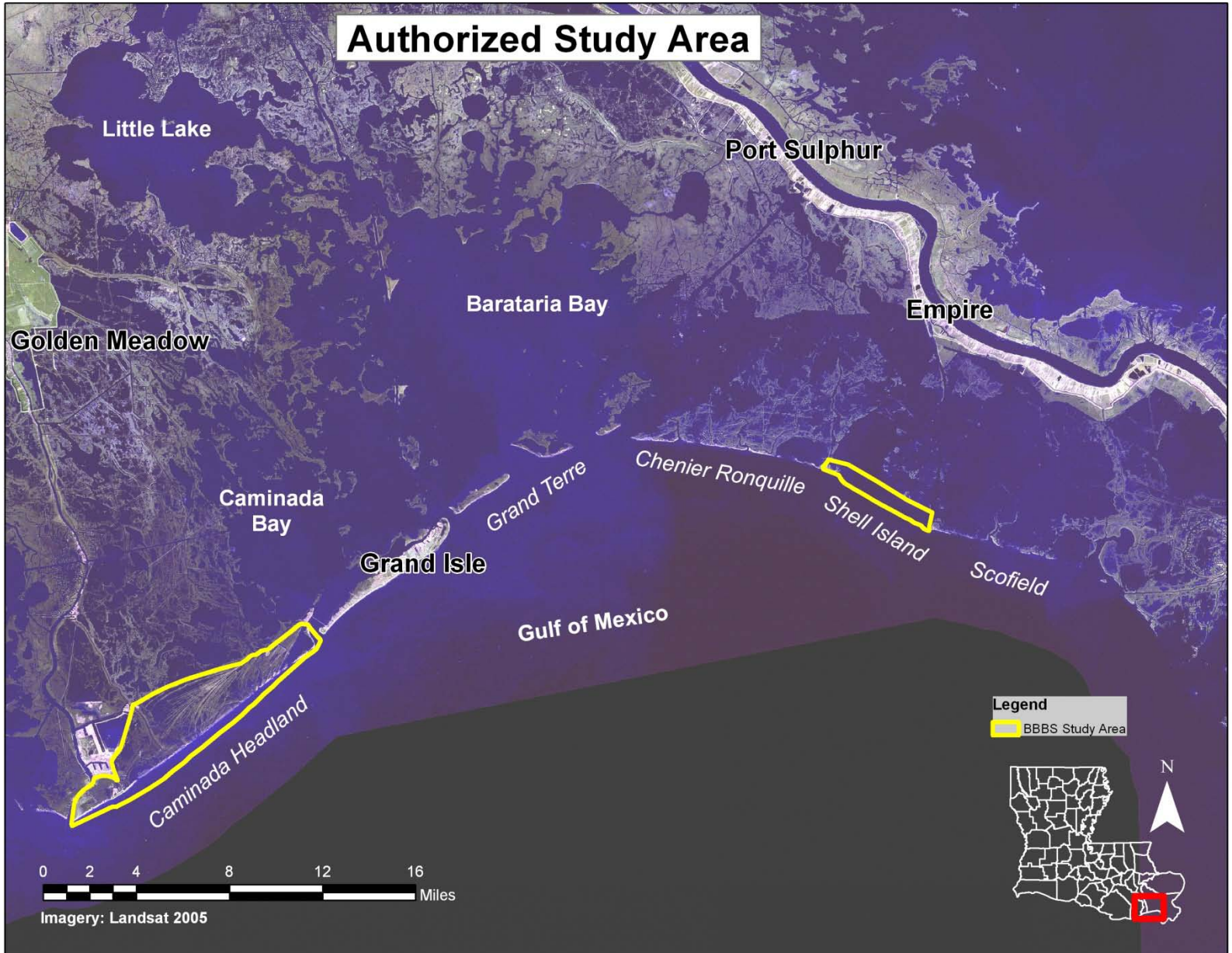
RESOLUTION: Final report includes fee simple acquisition, but states that non-standard estates will be evaluated in PED. Real estate cost estimates are based on fee acquisition and there is little risk that costs would be underestimated if non-standard estates are utilized. RE CoP is evaluating potential easement language for LCA 6 that may have applicability to BBBS.

RESOLUTION IMPACT: Concern Resolved.

HQUSACE POLICY REVIEW TEAM RECOMMENDATION

Release the report and EIS for S&A Review

LCA Barataria Basin Barrier Shoreline



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Lessons Learned

COL Edward R. Fleming
District Commander
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Project Authorization

- BBBS was identified as a critical near term restoration project in the 2004 LCA report.
- Section 7006 (c)(1)(C) authorized construction of BBBS.
- Recommended plan must be substantially in accordance to the 2005 Chief's report and within 150% of the authorized cost.

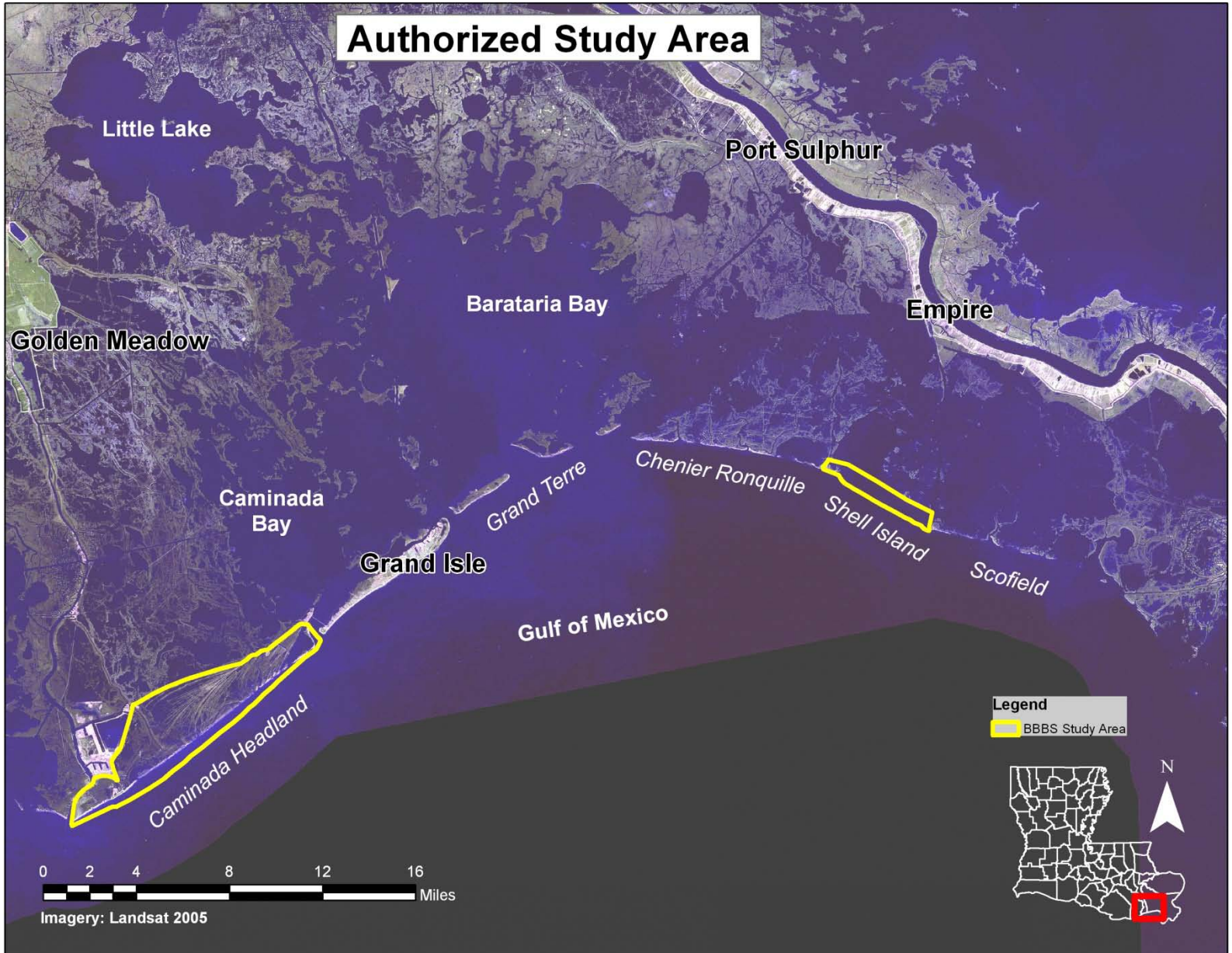
Project Formulation

- Project was formulated as a near term solution which would maintain the opportunity for and support the development of large-scale, long range comprehensive coastal restoration.
- During review of the Draft report, the plan was deemed not sustainable and therefore not policy compliant.
- Development of long-term sustainable plan was costly in terms of time and project funds.

Lessons Learned

- Early coordination with the Vertical team.
- Consistent guidance provided early in the process.
- Frequent IPRs to ensure that the VT is in agreement with the path forward.
- Effective communication is necessary to ensure efficient project planning.

LCA Barataria Basin Barrier Shoreline



Presentation to the

CIVIL WORKS REVIEW BOARD

Louisiana Coastal Area (LCA)

Barataria Basin Barrier Shoreline Restoration

Final Integrated Construction Report

LESSONS LEARNED

by

Edward Belk

Director of Programs

Mississippi Valley Division

March 22, 2012

US Army Corps of Engineers

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MVD Lessons Learned

- Long-term sustainability in a coastal environment vs. OMRR&R requirements proved to be a difficult and time consuming policy issue
- Early clear and properly documented guidance from leadership on areas of policy interpretation would have lessened delays
- Active Vertical Team involvement was essential for issue resolution