



WATER MARKS

Louisiana Coastal Wetlands Planning, Protection and Restoration News

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Rebuilding Coastal Louisiana

Planning for the Next 100 Years



The Authority to Shape Louisiana's Future
An Interview with CPRA Chairperson Sidney Coffe

Synergy Among CWPPRA Projects Shores Up the Coast

Congress to the Corps: Plan for Category 5



www.lacoast.gov

WaterMarks is published three times a year by the Louisiana Coastal Wetlands Conservation and Restoration Task Force to communicate news and issues of interest related to the Coastal Wetlands Planning, Protection and Restoration Act of 1990. This legislation funds wetlands restoration and enhancement projects nationwide, designating approximately \$60 million annually for work in Louisiana. The state contributes 15 percent of total project costs.



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ABOUT THIS ISSUE'S COVER . . .

From private dwellings to large public works such as levees and floodgates, Louisiana is rebuilding after the devastating storms of 2005. Because wetlands play an essential role in comprehensive hurricane protection, coastal restoration is a fundamental component of plans to secure Louisiana's future.

The photographs courtesy of
USACE, New Orleans District;
Urban Design Associates

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www.lacoast.gov
www.btnep.org
www.lca.gov

www.dnr.state.la.us/crm
www.crcl.org
www.louisianacoastalplanning.org

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www.lacoast.gov/newsletter.htm



**An Interview with
CPRA Chairperson Sidney Coffee**

The Authority to Shape Louisiana's Future

In response to the devastation of hurricanes Katrina and Rita, the Louisiana Legislature passed Act 8 of the First Extraordinary Session of 2005.

The new law has restructured the state's Wetland Conservation and Restoration Authority to form the Coastal Protection and Restoration Authority (CPRA). CPRA was established so that a single state entity would present and articulate a clear statement of priorities for coastal protection, including hurricane protection and coastal restoration, and ultimately would be responsible for implementing and enforcing the state's objectives. Most significant is the call to action dictated by Act 8.

Specifically, CPRA is charged with developing a comprehensive coastal protection and restoration plan for submission to the state Legislature by April 2007.

To that end, beginning in August 2006, CPRA conducted over two dozen stakeholder meetings to solicit comments from parish governing authorities, levee districts, and non-governmental groups and environmental organizations.

WaterMarks spoke with CPRA's chairperson, Sidney Coffee, to learn about the challenges the state faces and discuss its plans for rebuilding. Ms. Coffee also serves as coastal policy advisor to the Louisiana governor and as the state representative on the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Task Force.



WaterMarks: What practical difference does combining hurricane protection and coastal restoration make?

Coffee: Now we look at protection and restoration simultaneously. We won't just create levee alignments with no thought to natural processes or, when it isn't appropriate, undertake ecosystem restoration without an eye toward how it contributes to hurricane protection. We're using each effort to complement the other.

The last thing the state wants is a "great wall of Louisiana." We want a sustainable coast. If we just wall off the coast, we'll lose an ecosystem that is of huge economic and environmental benefit to the entire country. It's important not only to fisheries and wildlife, but also to the nation's energy infrastructure and navigation routes.

WaterMarks: Even with an integrated plan, won't you still have to make choices between protection and restoration?

Coffee: Of course. Trade-offs between protection and restoration are inevitable. In developing the master plan, science and engineering are guiding us, telling us what can be done. Then we can go to communities and say, "If we put a levee alignment here, it will degrade



Courtesy of USACE

Hurricane Katrina devastated New Orleans and destroyed an estimated 217 square miles of wetlands – an area three times the size of Washington, D.C. Although scientists hope some fraction of the marshes will eventually recover, the wetlands' decline increases the vulnerability of population centers, oil and gas infrastructure, and fisheries and wildlife.



fisheries in your wetland.” Or we’ll say, “We can do this particular restoration effort, but it’s going to prevent building category 5 hurricane protection here.” And each community will determine what its priorities are.

WaterMarks: How are you involving communities in the decision-making process?

Coffee: CPRA is working hand in hand with the Louisiana Recovery Authority (LRA). LRA is responsible for conducting a series of workshops to get input from stakeholders, to discover what is most important to coastal residents. Every area will have different needs depending on what that area produces, what its landscape is like.

Once we understand what people want, the CPRA planning team will incorporate it into the master plan. The plan will shape redevelopment and long-term recovery in Louisiana, and it will be a plan fully vetted through the public.

WaterMarks: What do you see as the greatest challenge to implementing a comprehensive and effective coastal protection system?

Coffee: Money. I have faith that we will have a good plan. Getting that plan funded will be the continuing challenge. At this point there is not adequate funding. There’s never been adequate funding for coastal restoration or hurricane protection.

The master plan incorporates projects to be built with the help of federal funding



through programs such as CWPPRA, the Coastal Impact Assistance Program (CIAP) and the Water Resources Development Act (WRDA). But we know that long-term funding to implement the master plan will take a steady stream of revenue that cannot be at the whim of congressional appropriations.

It’s no secret that for many decades Louisiana has fought for a fair share of Outer Continental Shelf oil and gas revenue — royalties the federal government receives from leasing agreements with companies that drill in offshore waters. Should a revenue-sharing bill be passed, Louisiana has demonstrated a constitutional commitment to dedicating this source of money to coastal restoration.

WaterMarks: What function can CWPPRA perform for the CPRA?

Coffee: CWPPRA can help by doing exactly what CWPPRA has always done: research, plan and construct coastal restoration projects. We’re not starting from scratch; we’ve learned many lessons. We’re building on everything that’s been done before. CWPPRA contributes an enormous amount of valuable experience. We sincerely



Architects and community planners encourage retaining the historic character of Louisiana while rebuilding with improved materials and techniques better able to withstand threats from storms.

Courtesy of Urban Design Associates

hope CWPPRA will always have a major role in implementing a comprehensive approach to coastal protection.

CPRA is very much a coordination authority, making sure that all programs of state agencies and of partnerships between state and federal agencies are consistent with each other. The master plan will provide overarching guidance, and that should be good news for every existing program out there right now.

WaterMarks: Has Louisiana learned something that other states should know?

Coffee: I think the lesson Louisiana can pass on is that our environment not only produces fisheries and provides habitat for wildlife, it also plays a major role in protecting our coastal communities, our water quality, and the nation’s economic and energy security. This is a working coast; one-third of the nation’s oil and gas moves through Louisiana. Our goal is to protect this coast and to sustain the value of this very strategic part of America. **WM**

CPRA: Coastal Protection and Restoration Authority

A Master Plan for Louisiana's Coast

The displacement of hundreds of thousands. A nationwide spike in fuel prices. A loss in the fishing industry of more than \$176 million.

The 2005 hurricane season forcefully demonstrated the economic and environmental importance of coastal Louisiana to the entire nation and the necessity of comprehensive coastal protection if Louisiana is to survive. So as the state began to dry out and clean up in the wake of hurricanes Katrina and Rita, Louisiana's government looked toward the future and grappled with the questions of how the state could most wisely rebuild, what plan would provide the best protection from future disasters.

"State officials realized hurricane protection and coastal restoration must be integrated," says Jon Porthouse, project director

for the Coastal Protection and Restoration Authority's Integrated Planning Team. "As the coast deteriorates, the gulf moves closer and increases the probability of flooding; a degraded landscape raises the risk of storm damage in our communities. But building flood protection structures can cause further degradation in the environment. We want to make sure we build them in a way that ensures the sustainability of the natural system."

To achieve this goal, in November 2005 the Louisiana Legislature established a single entity, the Coastal Protection and Restoration Authority (CPRA). Members include representatives from the governor's office, many state agencies,



Courtesy of USACE

coastal parishes and levee districts. CPRA works with various governmental and political entities including the Louisiana Recovery Authority, the Governor's Advisory Commission on Coastal Protection and Restoration and the state Legislature.

Attaining Sustainable Protection

The primary objective of CPRA's plan is to provide sustainable protection of coastal assets, both natural and man-made. Such protection will ensure that the coastal zone will continue

Eleven Lines of Defense Against Storms



Landscape and flora, engineering and architecture defend coastal residents against the destructive power of hurricanes, with evacuation the measure of last resort. Strengthening natural defenses enhances protection of all inhabitants of the environment and reduces reliance on man-made structures.

Courtesy of Lake Pontchartrain Basin Foundation

to exist for future generations to use in diverse ways. To achieve this goal, the plan will implement measures to

- reduce storm damages from flooding to residential, public, industrial and commercial infrastructure, providing a minimum level of protection from storm surge conditions equivalent to a one percent annual chance of recurrence
- sustain diverse fish and wildlife habitats that support an array of commercial and recreational activities coastwide

- maximize productivity and resilience (the ability of a system to withstand naturally variable conditions and/or recover from such disturbances) of the coastal ecosystem
- sustain, to the extent practicable, the unique heritage of coastal Louisiana by protecting historic sites and supporting traditional cultures and their ties to the natural environment

Proposed measures are structural, such as levees and floodgates; non-structural, such as elevated buildings and evacuation routes; or are methods of coastal restoration, such as

protecting or enhancing barrier islands, marshes and ridges.

These measures are complementary; combining them increases the potential success of each. For example, an expanse of marsh might protect a levee from erosive waves. However, compromises among the degree of hurricane protection, the amount of ecosystem disruption, the sustainability of economic activities and other factors will be unavoidable. Obtaining protection from a Category 5 hurricane might require structures that reduce tidal exchanges and alter vegetative cover. Stake-

Act 8

Passed during the First Extraordinary Session of the Louisiana Legislature in late 2005, Act 8 created the Coastal Protection and Restoration Authority (CPRA). The legislation mandates integration of hurricane protection and coastal restoration for the first time in Louisiana's history, and gives CPRA the power, duty and specific responsibility to provide the state with comprehensive coastal protection.

With expanded powers and duties, CPRA replaces Louisiana's Wetlands Conservation and Restoration Authority. CPRA will manage funding of coastal protection through the Coastal Protection and Restoration Trust Fund.

The bill defines the following terms:

Coastal protection: plans, projects, policies and programs intended to provide hurricane protection or coastal conservation or restoration

Hurricane protection: a system of barriers and associated elements to provide protection against tidal surges

Conservation and restoration: the conservation, protection, enhancement and restoration of coastal wetlands resources including but not limited to coastal wetlands and barrier shorelines or reefs



Louisiana Governor Kathleen Blanco and cabinet members (left to right) Department of Natural Resources Secretary Scott Angelle, Department of Transportation and Development Secretary Johnny Bradberry and Executive Director for Coastal Activities Sidney Coffee worked with key legislators to draft and pass legislation creating the CPRA in 2005.

Courtesy of USACE



In the year following Katrina's landfall, efforts to restore Louisiana's hurricane protection system included building improved floodwalls and installing temporary floodgates and additional drainage pumps. State and federal agencies are working to strengthen southern Louisiana's capability to endure severe storm conditions by combining flood protection with coastal restoration.

holders and the public will participate in choosing the tradeoffs.

Integrating Plans for Comprehensive Protection

To develop the master plan, CPRA formed the Integrated Planning Team (IPT) to coordinate efforts with state and federal agencies and other political subdivisions, including levee districts. Basing its work on past experience and the vision of south Louisiana's future as determined by stakeholders participating in numerous workshops, IPT formulated two alternative plans. Each

a combination of structural, non-structural and coastal restoration options, the plans weighed factors such as

- the importance of buildings and infrastructure necessary to human habitation in the coastal zone
- assets of national and state importance as well as of local value
- risks to the natural environment and natural resources, including probable future changes such as sea level rise

- risks of flooding and land loss under various storm conditions

The final master plan, due in spring of 2007, will combine aspects of the alternative plans deemed best able to achieve the authority's objectives. Louisiana's Department of Natural Resources will bear primary responsibility for carrying out plan elements relating to coastal wetlands conservation and restoration, and the Department of Transportation and Development will bear responsibility for the plan's hurricane protection measures. **WM**



Stakeholders' Vision Guides Engineers' Plans

Congress to the Corps: Plan for Category 5

Following the twin hits of hurricanes Katrina and Rita, the plight of Louisiana seized the attention of the nation.

From California to Minnesota to Maine, people were talking about the importance of Louisiana's coast. And in Washington, Congress took action, directing the U.S. Army Corps of Engineers to develop a plan to protect Louisiana's coastal area from fierce Category 5 hurricanes.

The Corps, in coordination with Louisiana's Coastal Protection and Restoration Authority and assisted by leading experts and engineers worldwide, is analyzing and designing a full range of flood control, coastal restoration and hurricane protection measures for coastal Louisiana. Integral to their planning efforts is the participation of residents and other stakeholders explicitly describing the future they want for Louisiana. Twenty million dollars in federal monies fund the effort, known as

the Louisiana Coastal Protection and Restoration project (LaCPR).

A Strategy for Coastal Protection

An initial task of the LaCPR team was to establish what levels of protection against storm damage the plan should provide to ecosystems, communities and infrastructure in all regions of the coastal area. The project also had to determine what storm conditions the plan should protect against, as the Saffir-Simpson Scale for categorizing hurricanes does not assess all potentially damaging factors, such as a storm's track or

height of surge. To assist stakeholders in determining their levels of risk tolerance and evaluating the relative merits of alternate plans, the Corps is using a risk-based methodology

to describe the likelihood of different storm scenarios, analyze the efficiency and effectiveness of possible risk reduction measures and compare their costs.

Workshops early in the plan's development emphasized the importance of integrating coastal ecosystem restoration and engineered flood protection. Neither without the other can adequately protect Louisiana's people, culture, economy and environment.

"Although new technology may develop, sustaining the coast does not necessarily require new restoration techniques," says Dr. John Lopez, representing the Lake Pontchartrain Basin Foundation in the plan formulation workshop. "Rather, it requires a new strategy to coordinate and prioritize conventional restoration methods and projects for coastal habitats."

Gregory Miller, a Corps project manager for the LaCPR Report, concurs: "The Corps of Engineers has embraced the multiple lines of defense strategy for protecting the Louisiana coast and its communities. The lessons of Hurricane Katrina show that a levees-only approach will not work. Restoring the wetlands that separate our cities from the sea is crucial for our long-term survival."



Landscape features, from underwater terracing to expanses of marsh to wooded ridges, contribute to mitigating a hurricane's destructive intensity.

Courtesy of USACE, New Orleans District



Courtesy of USACE

After assessing the performance of Louisiana's hurricane protection system during the 2005 storm season, engineers are designing structures more effective in withstanding storm surge and approaches to flood control less disruptive of the region's natural hydrology.

Adjusting priorities may alter the likelihood of building certain proposed projects or increase the scope of some existing projects. Restoration methods favored to achieve comprehensive coastal protection include expanding the beneficial uses of dredged materials and increasing the number and size of sediment delivery projects. Many scientists believe large-scale river diversions are essential if the Louisiana coast is to achieve long-term sustainability.

Approaching Old Problems with New Thinking

Some of the challenges of designing comprehensive coastal protection are as old as Louisiana's first earthen levees: poor soil foundation conditions, high subsidence rates, sea-level rise and the unknown effects of future storms. Yet today's engineers are confronting these challenges with new materials, new methods and new thinking.

For example, building a 40-foot-high barrier to storm surge would require a levee footprint and stability and wave berms approaching 1,000 feet in width. Made of conventional materials — earth, steel and concrete — such a barrier could easily be too heavy to construct on Louisiana's compacting soils.

Yet the benefit of a 40-foot-high barrier is evident to many of Louisiana's communities. The LaCPR project has encouraged engineers to devise ways to improve foundation conditions, construct barriers with lightweight materials, and design new barrier configurations to address the challenges of conventionally engineered hurricane protection. The plan will incorporate such innovative thinking, as well as fresh approaches to using the landscape for protection. An integrated system combining physical barriers, environmental features, and operation, maintenance and quality assurance programs will provide Louisianans the protection they desire.

Six-month and 24-month Benchmarks

In the summer of 2006, the Corps of Engineers submitted its Preliminary Technical Report to Congress. The report, available at [\[lacpr.usace.army.mil\]\(http://lacpr.usace.army.mil\), summarizes work on the plan to date and includes reports from workshops, public meetings and peer reviews.](http://</p>
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Outlining a strategic approach, the Preliminary Technical report considers key factors for completing the Corps' full plan, such as enhancing coastal features that reduce storm surge, identifying hurricane-induced threats to New Orleans, exploring potential technical collaboration with Dutch scientists, promoting storm-resistant domestic architecture, and determining coastal engineering design challenges.

To produce the final technical report, due to Congress in December 2007, the Corps will analyze and refine the design of the alternative plans under consideration. The Corps will continue its coordination with other planning activities and involvement with stakeholders through community meetings and public comment. Louisiana doesn't have to wait for the final report, however, before components of the comprehensive protection plan are recommended for authorization; requests for Congressional authorization of projects or for funding to advance promising concepts may be submitted at any time. **WM**

A Reader's Guide to Programs, Projects and Agencies

The ABCs of Restoration and Protection in Louisiana

CIAP

Coastal Impact Assistance Program

<http://dnr.louisiana.gov/crm/background/ciap.asp>

Authorized by Congress through the Energy Policy Act of 2005, CIAP assists six coastal states in mitigating the effects of oil and gas production on the Outer Continental Shelf (OCS).

Louisiana will receive an estimated \$540 million over four years to develop and implement a federally approved plan addressing the effects of OCS industries on the natural resources of its coastal areas. The plan will complement ongoing restoration activities and hurricane protection projects. Some CWPPRA-designed projects may be implemented through CIAP.

CPRA

Louisiana Coastal Protection and Restoration Authority

<http://www.louisianacoastalplanning.org>

Established by the Louisiana Legislature, CPRA is the single state entity with authority to set priorities and focus development and implementation efforts to achieve comprehensive coastal protection for Louisiana. CPRA couples hurricane protection with the protection, conservation, restoration and enhancement of coastal wetlands, barrier shorelines and reefs. CPRA oversees all levee districts in the state and is responsible for the disbursement of funds from the Coastal Protection and Restoration Trust Fund.

CWPPRA

Coastal Wetlands Planning, Protection and Restoration Act

<http://www.lacoast.gov/cwppra/index.htm>

Also known as the Breaux Act — for John Breaux, one of the Louisiana senators under whose sponsorship Congress first passed the legislation in 1990 — CWPPRA funds the planning and implementation of projects that create, enhance, restore and protect wetlands in coastal Louisiana. CWPPRA Task Force members are the state of Louisiana and five federal agencies.

LaCPR

Louisiana Coastal Protection and Restoration

<http://www.lacpr.usace.army.mil>

Congress directed the U.S. Army Corps of Engineers, in partnership with the state of Louisiana, to prepare a technical design and analysis of a full range of measures for flood control, coastal restoration and hurricane protection in south Louisiana. The federal government is funding the \$20 million, 24-month-long effort.

HPO

Hurricane Protection Office

<http://www.mvn.usace.army.mil/hps>

Established by the U.S. Army Corps of Engineers, New Orleans District, the Hurricane Protection Office, along with the Protection and Restoration Office, is responsible for long-term projects to restore, complete and improve southeast Louisiana's hurricane protection system. The HPO's projects are located primarily within Orleans, Jefferson, Plaquemines and St. Bernard parishes.

LCA

Louisiana Coastal Area

<http://www.lca.gov>

In March 2002, participants from state and federal agencies formed a study team to produce a single, in-depth restoration plan for coastal Louisiana. The resulting near-term plan identified large-scale projects such as river diversions, marsh creation, barrier island restoration and protection, and hydrologic restoration as solutions to environmental degradation applicable throughout Louisiana's coastal zone. Current planning for coastwide protection uses LCA studies extensively.

LRA

Louisiana Recovery Authority

<http://www.lra.louisiana.gov>

To envision, plan and coordinate Louisiana's future in the aftermath of hurricanes Katrina and Rita, Governor Kathleen Babineaux Blanco established the Louisiana Recovery Authority. The LRA collaborates with the governor and local, state and federal agencies to coordinate recovery efforts across jurisdictions, support locally driven community resurgence, and secure and prioritize redevelopment funding.

Louisiana Speaks

<http://www.louisianaspeaks.org>

The long-term community planning initiative of the LRA, Louisiana Speaks involves residents in determining south Louisiana's future and sets out actions and policies to achieve it. The effort is funded by the LRA Support Foundation, a private, nonprofit organization.

PRO

Protection and Restoration Office

A unit of the U.S. Army Corps of Engineers, New Orleans District, the PRO shares responsibility with the HPO for restoring, completing and improving southeast Louisiana's hurricane protection system in Jefferson, St. Charles, Lafourche and Terrebonne parishes. In addition, PRO is in charge of urban flood control in the New Orleans metropolitan area and is responsible for CWPPRA program administration, Corps-sponsored CWPPRA projects, LCA and LaCPR. The office also oversees coastal restoration and the MRGO deep-draft deauthorization study.

TFG

Task Force Guardian

A team under the oversight of Task Force Hope, TFG restored hurricane-damaged levees, floodwalls and floodgates before the 2006 hurricane season opened on June 1.

TFH

Task Force Hope

http://www.mvp.usace.army.mil/disaster_response

The team formed by the U.S. Army Corps of Engineers immediately following Hurricane Katrina, TFH manages levee and floodwall repairs, debris removal and all emergency response efforts that the Federal Emergency Management Agency requested the Corps to carry out.

Agency Cooperation Creates Restoration Results

Synergy Among CWPPRA Projects Shores Up the Coast

A dozen miles of wetland separate the freshwater marshes of the northern Barataria Basin from the salty Barataria Bay.

Called the Barataria Basin Landbridge, that slender band of wetland “is just melting away,” say coastal scientists.

“The landbridge is subsiding and eroding at an alarming rate — as much as 100 feet per year,” says Quin Kinler of the Natural Resources Conservation Service (NRCS). That land loss threatens not only fish and wildlife habitat but also oil and gas infrastructure and numerous communities — Barataria, Lafitte, even the west bank of New

Orleans.

“Without the landbridge, the entire basin would be subjected to greater intrusion from the Gulf of Mexico, including hurricane storm surge,” says Cheryl Brodnax of the National Oceanic and Atmospheric Administration (NOAA).

To restore the fragile marsh, agencies partnering under the Coastal Wetlands Planning, Protection and Restoration Act of 1990 (CWPPRA), commonly called the Breaux Act, developed a series of complementary projects,

each rebuilding or protecting a different piece of the landbridge. “When completed, these 12 projects will rebuild or protect from loss more than 5,000 acres of wetland,” Kinler explains.

Rebuilding the Landbridge

Two types of projects are needed to save the landbridge, Brodnax says, “those that replace what has been lost, and those that protect what is left.”

Joint efforts of the NRCS and the Louisiana Department of Natural Resources (DNR), the Barataria Basin Landbridge Shoreline Protection projects (BA-27, BA-27c and BA-27d) shore up fragile bayou banks by installing rock dikes and concrete panel structures that reduce wave energy and slow erosion. When finished, the projects will protect more than 20 miles of shoreline.

Meanwhile, Kinler says, “other NRCS projects on the landbridge have

Courtesy of Dale Garber, USDA-NRCS



Top: Along the east bank of Bayou Perot in Jefferson Parish, erosion claims up to 100 feet of marsh per year. To stop this rapid land loss, Phases 1 and 2 of the Barataria Landbridge Shoreline Protection projects (BA-27) built rock dikes along the bayou's east bank.

Right: The projects installed rocks weighing an average of 250 pounds along the bayou's shoreline. Where the soil is too soft to support rock dikes, concrete panel structures are being installed to buffer wave energy.



Courtesy of Dale Garber, USDA-NRCS



Courtesy of Louisiana Department of Natural Resources



Courtesy of NOAA

Left: Along the southern rim of Little Lake, CWPPRA restored nearly a thousand acres of wetland, its largest completed marsh creation and nourishment project to date. Rock protection installed along five miles of Little Lake shoreline slows the rate of erosion, explains Cheryl Brodnax of the National Oceanic and Atmospheric Administration. "Gaps in the rock dikes allow fish and other marine organisms to access the marshes, which provide vital habitat."

Right: The project used dredged sediment to rebuild marsh that had converted to open water. "Over the next few months, water will drain from the newly placed sediment, revealing solid ground. We will then plant these areas with smooth cordgrass to hold the sediment in place," Brodnax says.

installed water control structures to restore a more natural flow of water through the basin and reduce saltwater intrusion."

A future project of the DNR and the U.S. Fish and Wildlife Service (USFWS), Dedicated Dredging on the Barataria Basin Landbridge (BA-36), will use the structures installed under BA-27 to contain marsh-building sediment. "This project will deposit dredged sediment to create over 1,200 acres of wetland," says USFWS biologist Kevin Roy.

To replace 500 acres of lost landbridge marsh, a NOAA project, Little Lake Shoreline Protection/ Dedicated Dredging Near Round Lake (BA-37), pumped sediment into open-water areas. "We then nourished 450 acres of subsiding marsh nearby with a thin layer of sedi-

ment," Brodnax says. The project re-established the south rim of Little Lake, which was damaged by the 2005 hurricanes.

"The project was designed to maintain one of the few continuous land masses in the basin by keeping Little Lake and Barataria Bay separate," Brodnax says. "Protecting the marshes that separate the lake from the bay is critical for buffering the projects elsewhere on the landbridge. All of these projects work together to fortify this fragile part of the Barataria ecosystem."

The Power of Partnership

"The Barataria Basin Landbridge is an example of a big problem that CWPPRA is working to solve by breaking it down into smaller steps," Kinler says. "One of CWPPRA's strengths is identifying

places in the coastal landscape where a series of small steps can be very effective."

The work on the landbridge is made possible by the relationships the Breaux Act fosters among federal, state and local government agencies and with the public. "Coastal restoration programs are implemented with consensus from stakeholders. For 16 years, CWPPRA has been building relationships across agencies, while at the same time educating the public about the wetlands' importance. That creates cooperation among all these groups," Kinler explains.

"Restoring the landbridge is beyond the scope of any single project or agency," he continues. "The combined efforts of CWPPRA partners are a means to protect this important section of the coast."

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Synergy Among CWPPRA Projects Shores Up the Coast...continued

Breaux Act Projects Restore, Protect, Enhance 33,000 Acres

The narrow band of wetland that separates the northern Barataria Basin from the Gulf of Mexico is dissolving, as erosion and subsidence allow salt water to flow deep into the basin's marshes. "As salt water

moves into areas of the basin that were historically fresh water, it kills marsh vegetation, converting wetlands to open water," says Quin Kinler of the Natural Resources Conservation Service.

To preserve the fragile landbridge, a dozen CWPPRA projects protect eroding shorelines, create marsh and restore the wetlands' natural hydrology. **WM**

Barataria Basin Landbridge



Courtesy of USDA - Natural Resources Conservation Service, Lafayette, LA



CWPPRA Projects on the Barataria Landbridge

PROJECT	TECHNIQUE	CWPPRA PARTNERS
GIWW (Gulf Intracoastal Waterway) to Clovelly Hydrologic Restoration (BA-02)	Hydrologic restoration: rock weirs, canal plugs and rock breakwaters reduce saltwater intrusion	Natural Resources Conservation Service (NRCS) and Louisiana Department of Natural Resources (DNR)
Naomi Outfall Management (BA-03c)	Hydrologic restoration: water control structures manage flow of sediment-laden fresh water from a nearby siphon	NRCS and DNR
Jonathan Davis Wetland Protection (BA-20)	Hydrologic restoration: water control structures reduce tidal flow and wave action	NRCS and DNR
Barataria Bay Waterway West Side Shoreline Protection (BA-23)	Shoreline protection: water control structure and rock dike reduce saltwater intrusion and buffer wave energy	NRCS and DNR
Barataria Bay Waterway East Side Shoreline Protection (BA-26)	Shoreline protection: rock dike stabilizes shoreline, protects marsh from boat wakes and encourages sediment accretion	NRCS and DNR
Barataria Basin Landbridge Shoreline Protection, Phases 1 and 2 (BA-27)	Shoreline protection: rock dikes and concrete panel structures protect fragile shoreline	NRCS and DNR
Barataria Basin Landbridge Shoreline Protection, Phase 3 (BA-27c)	Shoreline protection: rock dikes and concrete panel structures protect fragile shoreline	NRCS and DNR
Barataria Basin Landbridge Shoreline Protection Project Phase 4 (BA-27d)	Shoreline protection: rock dikes protect fragile shoreline	NRCS and DNR
Dedicated Dredging on the Barataria Basin Landbridge (BA-36)	Marsh creation: dredged sediment delivered via pipeline to build new marsh and nourish existing marsh	U.S. Fish and Wildlife Service and DNR
Little Lake Shoreline Protection/ Dedicated Dredging Near Round Lake (BA-37)	Shoreline protection and marsh creation: dredged sediment creates new marsh while rock structures shield fragile shoreline	National Marine Fisheries Service and DNR
Mississippi River Sediment Delivery System — Bayou DuPont (BA-39)	Marsh creation: dredged sediment delivered via pipeline rebuilds wetlands	Environmental Protection Agency and DNR
South Shore of the Pen Shoreline Protection and Marsh Creation (BA-41)	Shoreline protection and marsh creation: concrete and rock structures protect shoreline; dredged sediment builds new marsh	NRCS and DNR

Experience Informs CWPPRA Design, Construction

Breaux Act Projects Weather Storms

With powerful waves and record-setting storm surge, the hurricanes of 2005 were a tough test of Breaux Act projects across the coastal zone. But out of 123 projects studied in late 2005, only 17 need post-hurricane repairs — a testament, say coastal scientists, to the collective knowledge and experience of agencies partnered under the Coastal Wetlands Planning, Protection and Restoration Act of 1990 (CWPPRA, or the Breaux Act).

CWPPRA partners refine and improve projects' design and construction through a process called adaptive management. "We evaluate every project carefully to determine where, how and why it worked or didn't work," says David Burkholder of the Louisiana Department of Natural Resources (DNR). "As we repair damaged projects and plan new ones, we apply those lessons."

At the Marsh Island Wildlife



Left: A rock riprap and steel sheetpile weir closes off a former oilfield canal at the eastern end of Marsh Island.

Right: Sections of the weir repaired following Hurricane Lili held as Hurricane Rita blasted across the island.

Refuge in Iberia Parish, adaptive management helped one project survive Hurricane Rita with little significant damage.

The 2001 Marsh Island Hydrologic Restoration project (TV-14) installed rock closures in seven navigation canals to keep salt water out of marshes and closed a breach between a small lake and Vermilion Bay. Less than a year later, Hurricane Lili severely damaged three of the structures.

"When a big slug of water hits structures like these, it flows around them at high speed, eroding the ends," says

Herb Juneau of the DNR.

"So when we repaired the damage from Lili, we did more extensive paving of the ends of the canal closures to prevent future damage."

Three years later Rita, a much more powerful storm, inundated the island with nine feet of water — yet the three repaired structures survived virtually unscathed, and the project suffered damage to just two of eight structures. "The success at Marsh Island, as well as at other projects across the coast, is the result of the design process incorporating CWPPRA's 16 years of experience," Burkholder says. **WM**

Courtesy of Louisiana Department of Wildlife and Fisheries, Stanley R. Alcorn, Louisiana Department of Natural Resources

WATER MARKS

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