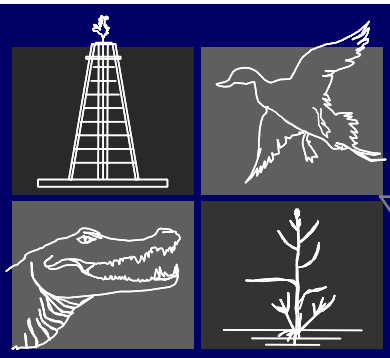
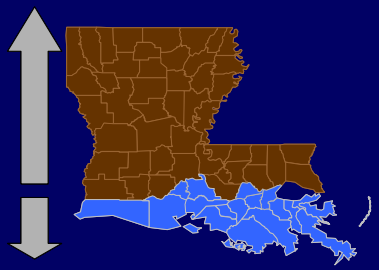


Stewardship Incentives for Louisiana's Coastal Landowners

In Review...

- *Differences between inland and coastal restoration of wetlands*
- *An agricultural model for engaging coastal landowners*
- *Use and non-use values of Louisiana's coastal wetlands*
- *Market-based and program based incentives*

Inland Wetlands (Farm Bill)



Coastal Wetlands (CWPPRA)

North of the Louisiana Coastal Zone (LCZ), the Farm Bill has been the primary source of conservation funding for inland, agricultural wetlands, while restoration of wetlands in the coastal zone is primarily conducted by CWPPRA. The two regions differ dramatically in both the cause of wetland loss and approach to wetland restoration. This paper uses agricultural conservation policy as a lens for examining the rationale and methodology of providing economic incentives for wetland restoration and stewardship on private lands in the LCZ.

DIFFERENT PATHS

Rapid development of two distinct trajectories for wetland conservation and restoration has occurred in Louisiana over the past decade. North of the Louisiana Coastal Zone (LCZ), the primary mechanism has been the Farm Bill. On-farm conservation programs have played a critical role in helping reduce the inland wetland loss rate by more than 75%.[1] Concurrently, Public Law 101-646, the Coastal Wetland Planning, Protection, and Restoration Act (CWPPRA), has emerged in response to the state's tremendous crisis of coastal wetland loss. Restoration projects sponsored by CWPPRA are expected to reduce predicted future losses of wetlands in the LCZ by 22%.[2]

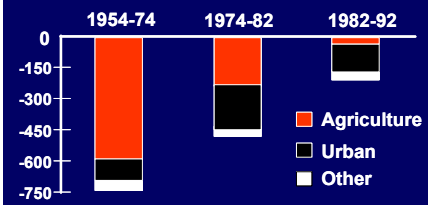
The distinction between these parallel models is more than a matter of geography or efficacy, major differences also exist with respect to programmatic philosophy. These philosophical differences derive from the historic causes of wetland loss in each region and the corresponding roles of public and private entities.

Louisiana's Inland Wetlands

As in most states, agriculture has historically been the primary cause of wetland loss in Louisiana. Of the more than 16 million acres of wetlands that covered 54% of Louisiana in 1780, approximately half have been lost, with the greatest amount of conversion occurring on forested "palustrine" wetlands.[3] Nationwide, wetland conversions attributed to farming averaged almost 600,000 acres annually during the 1950s to 1970s, and conversions remained as high as 280,000 acres per year through the early 1980s.

Agriculture-related wetland loss began to be dramatically curtailed in the 1980s with the advent of agro-environmental policy. Of particular interest has been the evolution of conservation compliance and incentive programs first instituted in the 1985 Farm Bill. These programs expanded rapidly during the 1990s and by 2000, conservation had become the third largest category of Farm Bill program spending, second only to corn and wheat subsidy programs. The most recent Farm Bill, the Farm Security and Rural Investment Act of 2002 (FSRIA), authorizes $43 billion in additional dollars for conservation, an 80% increase over the baseline conservation spending authorized in the 1996 Farm Bill.[4]

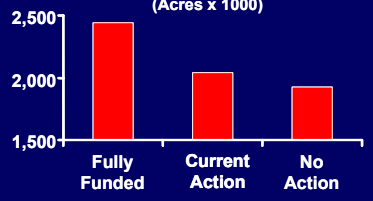
Source and Rates of Wetland Conversions in the U.S.
(Acres per year x 1000)



Source: ERS 2001

Wetland conversions attributable to U.S. agriculture have been drastically reduced, primarily because of new environmental regulations and Farm Bill conservation programs.

Predicted Coastal Wetland Acreage in Louisiana by the year 2050
(Acres x 1000)



Source: LaDNR 1999

The advent of agri-environmental policy has had little or no benefit in coastal Louisiana, where wetland loss continues largely unabated. Without billions in restoration funding, an additional 15% of the wetlands in the LCZ could be lost by the year 2050.

Cost Efficacy of Coastal and Inland Wetland Initiatives in Louisiana (1990-2000)

Category	Coastal CWPPRA Projects	Inland Farm Bill Contracts*
Total:		
No. Projects or Contracts	107	8,732
Acres enrolled or benefited	156,812	953,869
Program Spending to date	$402 million	$164 million
Average:		
Acres per project/contract	1,466	109
Cost per project/contract	$3.8 million	$18,726
Cost per acre	$2,564	$171

* *Aggregated data for CRP, WRP, EQIP, and WHIP*

Louisiana has benefited greatly from the expansion of farm conservation policy, with more than 900,500 acres currently under contract through programs such as the Conservation Reserve Program (CRP), Environmental Quality Incentives Program (EQIP), and the Wildlife Habitat Incentives Program (WHIP). These programs provide direct and indirect benefits toward the conservation and stewardship of Louisiana's inland wetlands.

The primary program for inland wetland restoration has been the Wetland Reserve Program (WRP). Louisiana leads the nation in WRP enrollment with more than 140,000 acres under contract as of 2001, an acreage level that could easily double given the expanded WRP spending authorized under FSRIA.[5] Combined with the conservation compliance requirement of the Swamp-buster rule, these programs have made private agricultural lands the largest single source of wetland conservation and restoration in Louisiana.

Louisiana's Coastal Wetlands

Unfortunately, the mitigation of agricultural impacts has had no effect in the LCZ, where wetland losses continue largely unabated. Unlike most states, Louisiana contains a vast area of deltaic coastal wetlands, 29% of which have been lost to the Gulf of Mexico over the past century. As seen inland, Louisiana's coastal wetlands have also been lost primarily because of human factors. In the early 20th century, a contiguous network of levees was constructed on the Mississippi River, effectively halting deposition of the alluvial sediment and nutrients that once sustained Louisiana's coastal wetlands.

Additionally, thousands of miles of canals dug for navigation and commerce have greatly accelerated the rate of erosion and saltwater intrusion. Combined with natural processes such as subsidence (marsh sinking), these factors have resulted in a net loss of 1,500 square miles of coastal Louisiana over the past century.[2] Geologists predict that by the year 2050, an additional 700 square miles of coastal Louisiana could be converted to open water. The economic implications of such loss would be dire for a region that provides infrastructure for more than 90% of the state's economy and is home to more than half the state's population.[6]

As previously stated, CWPPRA has been the primary mechanism for addressing wetland loss in coastal Louisiana. Since 1990 the act has authorized 107 large-scale, public restoration projects at a cost of more that $400 million. Unfortunately, the annual CWPPRA budget of $30 to $40 million constitutes less than 10% of the funding that would be necessary to fully address Louisiana's coastal land loss crisis.[2] This economic shortfall suggests the need to explore alternative restoration opportunities, and given that 75% of wetland acreage in the LCZ is privately owned, the "inland model" deserves consideration.

PUBLIC VS. PRIVATE

The average CWPPRA project measures 1,466 acres and costs $3.7 million to implement - a scale and funding level that is much larger than inland conservation contracts.[2] By comparison, farm bill conservation initiatives implemented in Louisiana since 1990 have averaged 109 acres and cost $18,726 per contract.[7] The main distinction between these policies is the role played by private landowners.

From a cost-efficiency standpoint, the inland model yields an apparent advantage by partnering with private entities to meet wetland resource conservation and restoration objectives. For example, implementation costs since 1990 have averaged $171 per acre for inland conservation, compared to $2,564per acre for coastal restoration. Furthermore, inland conservation programs have contracted 600% more wetland acreage in Louisiana than the acreage benefited by CWPPRA projects, and done so at 40% of the cost. The obvious weakness of such a comparison is that of "apples and oranges," comparing the

An Alligator Incentive

Each year, Louisiana conducts a controlled wild alligator harvest in which hunters are allowed to take a certain number of alligators from specific tracts of land, depending on habitat quality and population estimates. The majority of the state's alligators are found in coastal parishes with vast areas of marshland. Some marshes are better habitat for alligators than others. Allocation of "gator tags" can range from 1 per 1,000 acres for poor habitat to 1 per 100 acres for habitat of exceptional quality. In general, the number of tags allocated is lower for higher salinity habitats, but other factors are considered, including food supply, water access, and the interspersion of marsh and water. Alligator tag allocations are an example of how linking a marketable surface commodity to habitat quality can provide a financial incentive for wetland stewardship by coastal landowners.

Retaining the Title

As Louisiana's coastal wetlands have succumbed to erosion and subsidence, areas once categorized as highly productive fresh, intermediate, or brackish marsh have begun to transition into less productive salt marsh. In many areas, privately owned coastal property has completely transitioned to open water and title is retained only for subsurface revenues. As private coastal lands transition to higher salinity habitats, landowners will find it increasingly difficult and costly to engage in wetland restoration and stewardship.

landscape-scale, public agency-sponsored coastal restoration projects to considerably smaller programs which utilize incentive payments to promote resource stewardship on private lands. Likewise, the comparison is also constrained by the fact that dissimilar topographies warrant different approaches to restoration. Wetland restoration in LCZ is more expensive because of logistical constraints.

Nevertheless, the comparison does provide a very stark contrast of program philosophies regarding the role of public and private entities, and there are some indications that each model would benefit from a hybridization of technique. For example, the 2002 Farm Bill includes hundreds of millions in new program dollars specifically targeting conservation issues beyond the level of individual farms to watershed and ecosystem levels.[5] Conversely, coastal wetland restoration policy might likewise benefit by developing some financial incentives to harness the aid of the numerous private landowners in the LCZ. Such incentives are demanded not only by the environmental crisis of coastal land loss, but by an economic crisis as well.

Use Value: A 1-2 Punch?

The market value of a coastal wetland property is determined like any other piece of real estate, through a consideration of "use-value," physical improvements and expected productivity. Like the physical landscape of the LCZ, this value has also been deteriorating in recent years, due to a cascading of several negative economic factors. Colloquial references to wetland value in the LCZ typically delineate between sub-surface value and surface value. The vast majority of income to coastal landowners has historically been derived from the sub-surface source, specifically, oil and gas production royalties. Conversely, coastal landowners receive comparatively little income from surface activities. Real estate values are considerably lower than in neighboring states, where rigid coastal topographies have allowed for heavy urbanization and industrial development. Surface values in the LCZ are usually limited to a narrow range of commercial wildlife commodities (i.e. lease income from waterfowl hunting, alligator harvesting, and fur trapping).

Complicating the matter, the income initially generated from oil and gas royalties has led to multiple heirs, resulting in a highly fractioned ownership structure in many areas of the LCZ. In recent years, much of this revenue has been declining, as mineral resources have become depleted and new exploration activities have moved offshore. Oil and natural gas production within the LCZ peaked in 1970, and is now on a long-term decline rate of about 4% per year.[8]

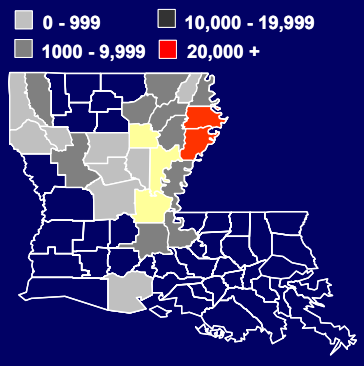
Combined with the tremendous problem of coastal land loss, the economic result has been a 1-2 punch: a rapidly deteriorating coastal zone divided into numerous small tracts of declining sub-surface value and relatively little or no surface value. Finally, many coastal landowners may perceive the knock-out blow to be the recent increase in environmental regulation in recent years. One survey of more than 200 landowners in the LCZ indicated that their greatest concern was the incremental loss of property rights through environmental regulation.[9] Taken together, these economic factors have greatly limited the financial motivation of most private landowners to engage in restoration and stewardship.

Many coastal landowners find it difficult simply to meet property tax obligations. Tax difficulties, in turn, are exacerbated by the property's physical deterioration. In short, as coastal marsh succumbs to coastal erosion, use-value decreases, primarily because of a reduction in productivity caused by the loss of organic matter.[10] In 1996, the Louisiana Tax Code (LTC) instituted a usage-value tax scheme that assessed lower rates per acre at higher salinities (e.g. fresh marsh: $7, brackish marsh: $6, salt marsh: $5). Although, some relief was afforded by the graduated tax scheme, the decrease was not substantial, and many coastal landowners continue to pay high taxes on property of very low productivity.[11]

"Meeting society's demand for improved environmental quality requires a broader definition of farm "output" to include environmental amenities such as rural landscape amenities, wildlife habitat, wetlands, and improved water and air quality - along with food, fiber, and timber production ..."

Food and Agricultural Policy: Taking Stock of the New Century, USDA

2001 WRP Enrollment in La (Acres)



Louisiana leads the nation in acreage enrolled in the Wetlands Reserve Program. Programs like WRP have made the Farm Bill a major provider of the environmental services demanded by the American public. Unfortunately, most conservation programs do not extend into the coastal zone.

Petroleum is the primary income source for LCZ landowners, although off-site values such as fisheries are highly dependent on private coastal wetlands. Private wetlands also provide many environmental functions, such as flood protection and wildlife habitat. Billions of dollars in program spending have been predicated on such amenities through the conservation title of the Farm Bill. Yet, landowners in the LCZ have not had access to those dollars.

Non-use Value: Agriculture as a Precedent?

Diminishing income streams, rising regulatory costs, and tax concerns also plague inland landowners, but these factors are not usually not exacerbated by loss of the physical landscape. Furthermore, on many agricultural lands, these economic constraints are partially offset by public to private transfer payments. Agricultural subsidies have historically come in the form of commodity payments and price supports. The payments were provided for a variety of reasons, including income stabilization, national security, global competitiveness, and to support a "cheap food" policy.[12] Yet, the rationale and mechanisms for providing farm subsidies has changed over the past century. Today, farm output is no longer defined purely by traditional agricultural commodities. Farmers are regularly compensated for conserving or restoring environmental services, the "non-use" value of their acreage.

Though public demand for environmental amenities is increasing, conservation itself is by no means new to agriculture. The first conservation concerns originated during the Dust Bowl era of the 1930s. The 2002 Farm Bill authorizes more than 40 million acres of contract easements for provision of the non-market values associated with wetlands, such as: wildlife habitat, improved water quality, and flood storage.

The Farm Bill as a social contract has evolved to a point where the American public is often more supportive of paying private landowners for conservation than for the production of agricultural commodities.[13] Unfortunately, this new social contract does not yet extend into the coastal zone. Although the private wetlands of the LCZ contain a tremendous amount of ecological service value, they lack the agricultural prerequisite necessary to participate in most conservation programs.

Making the Case

Natural resource management agencies in Louisiana are in need of a more current accounting of the non-use value of the state's private coastal wetlands. The urgency behind this need derives from the attempt to justify federal funding requests for much-needed coastal restoration. Preventing the predicted loss of an additional 600-1,000 square miles of Louisiana's coastal wetlands is expected to cost $14 billion over the next 50 years. This estimate was developed by extrapolating the costs of implementing and maintaining the various restoration technologies needed to address the predicted loss. But estimating the costs of doing nothing is more problematic.

"No-action" scenarios produce estimates of economic loss that ranges from $27 billion to $100 billion.[2] This wide range of impacts suggests a need for standardizing the assumptions and methods in which non-use values are calculated. Nevertheless, updated estimates are needed because any large scale disbursement of federal restoration funding will likely be justified largely on these non-market benefits.

In 2000 the $7.8 billion in restoration funding approved by Congress for the Comprehensive Everglades Restoration Plan (CERP) was almost completely predicated on environmental benefits.[17] Public wetlands account for more than 60% of the wetland acreage supported under CERP. The majority of environmental benefits from the LCZ derive from wetlands that are 75% privately owned.

INCENTIVE MECHANISMS

The following section provides a partial list of market-based and program-based incentive mechanisms for private landowners in the LCZ. Some of the methods listed are conceptual, others are in use on agricultural lands, and a few are already supported by relatively small amounts of government funding.

Market-Based Mechanisms for Wetland Stewardship on Private Coastal Lands

Mitigation Banking

In 1992, federal guidance was established that allowed for partial commercialization of the mitigation sequence mandated under Section 404(a) of the Clean Water Act. Since that time, Louisiana has seen the establishment of 44 wetland mitigation banks, in which non-jurisdictional wetlands are restored by entrepreneurs, who in turn sell mitigation credits to developers to offset the impacts of development. However, only five of these mitigation areas have been approved in the LCZ, primarily because of the relatively high cost of implementation and the high risks associated with long-term or perpetual maintenance in a rapidly deteriorating environment.[18] To reduce costs and risks and enhance sustainability, additional mitigation areas could be strategically permitted on those private lands in the LCZ that are adjacent to, or directly benefited by, large-scale public restoration projects (e.g. freshwater re-introductions).

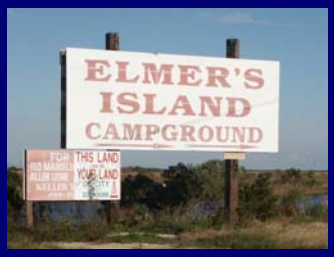
Carbon Sequestration

Carbon sequestration, the storage of organic carbon in terrestrial or aquatic forms, can be used to reduce or slow the atmospheric build-up of carbon dioxide, the primary greenhouse gas linked to global climate change. The highly productive fresh to brackish marshes of the LCZ contain some of the highest amounts of soil organic carbon (SOC) in the U.S., and thus may also represent the greatest potential for carbon sequestration.[19] Green payments or carbon credits (as with wetland mitigation banking) could be allotted to private LCZ landowners to the extent that the organic fraction of coastal marshes is conserved through Best Management Practices (BMPs) designed for wetland restoration and conservation. However, the market mechanisms for providing carbon sequestration payments and/or credits remain largely conceptual and federal guidance is lacking.[20]

Long-term Leasing Arrangements

Most large tracts of private land remaining in the LCZ have been maintained by petroleum companies or large-scale landholder conglomerates. These entities are primarily interested in subsurface income, with surface usage typically leased for commercial and recreational wildlife harvesting. Such arrangements often are not cost-effective, because of the high maintenance and overhead costs and the short-term nature of traditional leases. Some large-scale landholders have experimented with long-term leasing via closed-bid auction. By extending the lease contract period (e.g. from 1-5 years to 15-25 years), overhead costs can be reduced, and to the extent that the lessee agrees to incur a greater responsibility for stewardship and upkeep, maintenance costs can also be reduced. However, because long-term leases cover a time period that is often 4-5 times the length of traditional leases, tract size can quickly become a limiting factor. If lease tracts are not sufficiently subdivided, the economic scale required to participate becomes prohibitive and the auction may fail to attract a sufficient number of bids.

Sale or Donation



In a limited number of cases, state interests or a land trust may seek to purchase the surface and subsurface rights of private coastal lands that are of significant ecological importance. However, such cases are not typical and until 1996, sub-surface and surface rights of coastal property were legally joined under Louisiana law. Now coastal landowners may be able to retain ownership of sub-surface mineral rights if they agree to donate the surface rights of their property to the state of Louisiana or to an approved conservation organization. This option is reserved for only those donations that facilitate development and implementation of the state's coastal restoration plan. It is likely that some LCZ landowners would gladly sell or forego their surface rights in exchange for the reduced tax and regulatory liability afforded under such arrangements.

Tax Incentives

Despite the economic constraints of property ownership, most landowners of the LCZ reportedly would prefer tax incentives over outright government purchase.[9] In many states where wetlands comprise a small percentage of the surface land area, property delineated as wetlands have been deemed tax exempt. Ryan and Susman (2003) suggest that such an exemption may be a viable option in coastal Louisiana, if the potentially debilitating effects to local revenue could in turn be offset by severance, processing, and mineral taxes. The authors report that the current tripartite scheme of marshland taxation should be refined to include a more landowner-specific approach to tax assessment. At a minimum, the LTC should develop a more detailed use-assessment scheme to ensure that property taxes are assessed according to activity and not by extent standards.[11]

Program-Based Mechanisms for Wetland Stewardship on Private Coastal Lands

Species Control

The LCZ is plagued with several invasive plants that cause untold economic damage. Species of greatest concern include hydrilla (*Hydrilla verticillata*), water hyacinth (*Eichhornia crassipes*), chinese tallow (*Triadica sebifera*) and Salvina spp. (*S. minimia and S.molesta*). In most cases, control programs for these plants are funded only at the state and local levels. Until recently, the same was true for control of nutria (*Myocastor coypus*), a non-native herbivore. At any one time, nutria can impact as much as 100,000 acres of coastal marsh.[22] In 2002, CWPPRA put aside $2.6 million annually for five years to subsidize nutria trapping. A $4-per-nutria-tail incentive payment is now provided through the Comprehensive Nutria Control Program (CNCP). The CNCP is expected to significantly reduce nutria populations while supplementing the economic surface value of private lands in the LCZ. (Photo by Kevin Savoie, LSU AgCenter)

Species Protection

Of the 26 Threatened and Endangered Species (TES) of plants and animals listed in Louisiana, approximately 20 are found in the LCZ .[23] Compensating private landowners for the protection of TES is not a novel concept, and various compensation mechanisms have been suggested for TES species such as red wolves and red-cockaded woodpeckers. One program currently in place could provide LCZ landowners with such incentives. The U.S. Fish and Wildlife Service awards $10 million annually through the Private Stewardship Grants Program (PSGP) to encourage coastal landowners and their partners to protect and restore imperiled species and their habitats.

Conservation Grants and Easements

In the 1970s and 1980s, many landowners in the LCZ participated in the Water Bank Program (WBP) which provided $30 million annually for wetland preservation easements. Now such easements are available under a new initiative called the Coastal Wetlands Reserve Program (CWRP) sponsored by NRCS. Additionally, landowners in the LCZ interested in waterfowl habitat improvement projects may be eligible for funding under the North American Wetlands Conservation Act (NAWCA). The NAWCA was established in 1989 to provide small grants and cost-share partnerships for wetlands conservation projects. The total estimated funding for NAWCA in 2002 is approximately $80 million. Finally, the National Oceanic and Atmospheric Administration (NOAA) recently developed a Coastal and Estuarine Land Conservation Program (CELCP) that provides approximately $15 million annually for the protection of coastal estuarine lands that are important for their ecological, conservation, recreational, historical or aesthetic value.

Restoration Cost-share

Perhaps the most promising subvention mechanism needed by landowners in the LCZ is some type of direct cost-share assistance for privately conducted restoration using native vegetation. The USDA/NRCS operates a Plant Materials Center (PMC) in the LCZ that develops improved strains of native coastal vegetation for use in federally funded restoration programs. To date most of this effort has been targeted at the selection and improvement of cultivars of Smooth Cordgrass (*Spartina alterniflora*), the dominant plant found in Louisiana's brackish and salt marshes. More recently, the PMC has expanded its experimental selection efforts into additional grasses such as: Seashore Paspalum (*Paspalum vaginatum*) and Bitter Panicum (*Panicum amarum*); and woody species such as Black Mangrove (*Avicennia germinans*) and Southern Wax Myrtle (*Myrica cerifera*).

Several landowners in the LCZ have begun using native vegetation on their own to protect those areas of their property at high risk for erosion. However, planting the vegetation is an expensive and labor intensive process. Some form of restoration cost-share is needed to defray these costs and encourage more LCZ landowners to re-vegetate critically eroding areas of their property. The PMC currently releases parent materials to nurseries specializing in coastal wetland plant production. These nurseries propagate the approved plants commercially and then sell the resulting plants to CWPPRA and other federal entities for use in coastal restoration projects. The establishment of cost-share mechanisms in support of coastal revegetation on private lands would bolster this fledgling industry and greatly help to expand revegetation efforts in the LCZ.

A weir controls water levels and salinity - Cameron Parish.

Recycled Christmas trees protect interior marsh - Port Fourchon, La.

Sand fencing restores dunes on a barrier island - Terrebonne Parish.

Native grass headed for a marsh restoration project - Cocodrie, La.

SUMMARY

Over the past decade wetland restoration in Louisiana has diverged into two primary pathways: the inland-approach, via the Farm Bill and the coastal-approach, via CWPPRA. The two programs are delineated by more than mere geography; they also differ dramatically in the way respective conservation and restoration projects are implemented. A comparison of these two models provides a stark contrast regarding the respective roles of the private and public sector.

The inland model confers an apparent advantage over the coastal model by engaging the self-interest of private landowners in order to minimize costs and maximize the acreage benefited by restoration spending. Since 1990, inland conservation programs such as WRP, CRP, WHIP, and EQIP have contracted 600% more acreage in Louisiana than the acreage benefited by CWPPRA projects, and done so at 40% of the cost. Admittedly, such an assessment suffers from a lack of standardization, comparing large-scale agency sponsored coastal restoration projects to considerably smaller projects that utilize incentive payments to promote resource stewardship on private lands. But the comparison is intended as neither indictment nor endorsement. The intent is to illustrate the need for a hybridization of technique. Since CWPPRA does not pay for easements, any incentive payments designed to engage coastal landowners would most likely evolve from the conservation initiatives of "farm" policy.

Rethinking the Prerequisite

Coastal wetland loss in the LCZ represents unparalleled threats to ecological services, such as waterfowl over-wintering, estuarine fisheries habitat, and storm surge buffering. While the provision of such services on private lands is increasingly subsidized via farm conservation programs, such programs do not typically extend into the coastal zone. Private lands of the LCZ lack the agricultural prerequisite that has traditionally afforded protection via the Farm Bill. Conservation spending should be directed to those private lands with the greatest need for protection and restoration.

Given the significant ecological value of Louisiana's coastal wetlands, it is logical that some type of public to private subvention mechanisms are justified, including financial support for species control or species protection, conservation grants, and restoration cost-share agreements. A number of market-based mechanisms also warrant consideration, including: mitigation banking, carbon sequestration, creative leasing arrangements, decoupled property transfer, and tax incentives.

Engaging Coastal Landowners

Coastal Louisiana has lost 1,500 square miles of wetlands over the past century and it is predicted that an additional 600-1,000 square miles will be lost by the year 2050. Though 75% of this loss will occur on private lands, little or no direct restoration funding is available to private interests. Meanwhile, owner-initiated restoration is severely limited on private LCZ lands because of the economic reality of diminishing surface and sub-surface incomes, increasing regulatory constraints, and an extant tax structure that fails to adequately delineate the use value of coastal property. These economic constraints are further exacerbated by the reduction in surface productivity as coastal property succumbs to erosion.

At its current level of funding, CWPPRA is providing less than one-tenth of the dollars necessary to adequately address Louisiana's coastal land-loss crisis. Given this budgetary constraint, it is logical to seek more cost-effective alternatives for coastal restoration. To fully address Louisiana's tremendous crisis of coastal land loss, state and federal decision makers need concise assessments of the full range of conservation and restoration options, including public to private transfer payments. In short, coastal landowners represent a largely untapped resource for carrying out small-scale, cost-effective wetland restoration and stewardship.

Building rock break-waters to reduce wave erosion - Grand Isle, La.

Reintroducing the Mississippi River to coastal marsh - St. Charles Parish.

On Private Lands

The technology necessary for coastal restoration and management continues to evolve in complexity, cost, and efficacy, but in most cases will either affect or be implemented on private lands. As a result, future work needs to focus on the role that private coastal landowners can play in the protection of these resources and in particular the way in which landowners can be encouraged to use their landscape management expertise for coastal protection and restoration.

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