Tulane Institute on Water Resources Law & Policy

# Financing the Future

## Turning Coastal Restoration and Protection Plans Into Realities: The Cost of Comprehensive Coastal Restoration and Protection

**First in an Occasional Series**
**An Issue Paper of the Tulane Institute on Water Resources Law and Policy[1]**
**August 18, 2014**


### Summary

- The cost of restoring and protecting coastal Louisiana will significantly exceed the $50 billion budget set forth in the 2012 Master Plan, as will the projected benefits of those actions.
- Important elements of water risk and resource management – such as internal drainage, urban subsidence management, and the operation and maintenance of federal hurricane protection systems – are not included in the 2012 Master Plan.
- The burden of financing the 2012 Master Plan and associated works will fall to a considerable extent on the state and local governments.
- The investment of future federal funds in this coast will depend on the prior identification and commitment of non-federal funds.


### Introduction

Over the past eighty years, Louisiana has lost approximately 1,880 square miles of coastal land, which is nearly the size of Delaware.[2] If nothing more is done over the next fifty years, an additional 1,750 square miles of land could be lost, totaling a combined area that approaches half the land area of New Jersey.[3] As dire as that prospect is, it paints an incomplete picture of both the risks facing this economically robust and culturally rich coast and the need to act with urgency. Long before the coast slips beneath the waves, the communities of the region will face threats to affordable insurance and financial capital – which are necessary to sustain growth, prosperity, and even basic municipal services. The ramifications of the Biggert-Waters

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[2] According to the 2010 U.S. Census, Delaware has a land area of 1,948.54 square miles; available at quickfacts.census.gov/qfd/states/10000.html (last accessed Aug. 15, 2014).

[3] According to the 2010 U.S. Census, New Jersey has a land area of 7,354.22 square miles; available at quickfacts.census.gov/qfd/states/34000.html (last accessed Aug. 15, 2014).

Flood Insurance Reform Act of 2012 offered a glimpse of how changing coasts and coastal risks can affect the cost of insurance. Similar experiences can be expected in the realms of private and public finance as the future pace of change undermines the confidence of lenders that our communities have a viable future.

These impacts and costs are not preordained. Within some limits, they can be prevented or reduced with bold, thoughtful action. The Louisiana Coastal Protection and Restoration Authority (the "LACPRA") called for that kind of action when it published the latest incarnation of Louisiana's Comprehensive Master Plan for a Sustainable Coast in 2012 (the "2012 Master Plan"). The 2012 Master Plan is intended to be a comprehensive, science-based plan that details specific projects to restore and protect Louisiana's vanishing wetlands and coastal communities. These wetlands and communities play a significant role in providing the nation's energy, commerce, and seafood.[4]

In addition to outlining specific projects necessary to slow or arrest coastal land loss, the 2012 Master Plan also attempts to put those baseline projects into a realistic budgetary context. The Plan estimates that the baseline action required to stop coastal land loss will cost $50 billion[5] over a 50-year implementation period.[6] But will that be enough, and where will those dollars come from? Those are the questions this series of issue papers will address.

This paper will look at the projected cost of saving Louisiana's coast and protecting its coastal communities. Future papers in this series will review the identified and prospective sources of funds needed to finance those costs.

**Presumptions and Methodology**

The purpose of this inquiry is to foster a more informed and focused public discussion of how to proceed with the vital mission of sustaining this coast and its communities. It is not intended to question the value of that undertaking; indeed, we are proceeding from the presumption that the value and urgency of saving this coast is a settled proposition.

In doing this analysis we will rely on the program choices and cost estimates contained in the 2012 Master Plan and other major undertakings such as the Greater New Orleans Urban Water Plan, the Lake Pontchartrain and Vicinity Hurricane Protection program and the Morganza to the Gulf levee system. The LACPRA is required to refine, update, and reissue the coastal master plan every five years, and it is important to keep in mind that program decisions, cost

[4] Louisiana's coast provides "protection for infrastructure that supplies 90% of the nation's outer continental oil and gas, 20% of the nation's annual waterborne commerce, [and] 26% (by weight) of the continental U.S. commercial fisheries landings." Louisiana's Coastal Protection and Restoration Authority. Louisiana's Comprehensive Master Plan for a Sustainable Coast, 20 (2012). Available at issuu.com/coastalmasterplan/docs/coastal_master_plan-v2?e=3722998/2447530 (last accessed Aug. 6, 2014).

[5] 2012 Master Plan, 99.

[6] An investment of $100 billion 2010 dollars would "build or sustain between 910 and 1,240 square miles of land by 2061 and be building or sustaining land coast wide at a rate between six and 18 square miles per year, depending on future coastal conditions. 2012 Master Plan, 36.

estimates, and financing options are also subject to change. It is beyond the scope of this analysis to advocate for or against any aspect of any of those plans or programs.

**The $50 Billion Price Tag—A Closer Look**

Public discussion about the future of coastal Louisiana often focuses on the 2012 Master Plan, its estimated $50 billion cost, and the projection that Louisiana can expect between $20 and $50 billion over the next 50 years for coastal restoration through eight current and potential funding sources.[7] Although the 2012 Master Plan itself is clear on the point, it is not widely understood that the Plan's cost estimates are not all inclusive and, while projected over a 50 year period, are stated in 2010 constant dollars.[8] The 2012 Master Plan is clear that its cost estimates do not include the costs of operating and maintaining flood protection projects or maintaining the banks of federally authorized navigation channels. Also excluded are such vital aspects of the "multiple lines of defense", embraced by the 2012 Master Plan, as interior water management, land use planning, and subsidence management. For example, the recently completed comprehensive and integrated Greater New Orleans Urban Water Plan for St. Bernard Parish and the east bank sides of Orleans and Jefferson Parishes calls for investing $6.2 billion, albeit to achieve an estimated benefit of $22.3 billion or more.[9,10]

What this means is that the projected cost of restoring coastal Louisiana and providing protection to its residents will be significantly more than $50 billion over the next 50 years. It also needs to be understood that a major portion of those costs must be financed by the state or local governments via funding mechanisms that have not yet been identified. A clear understanding of those two facts is vital to financing the implementation of the 2012 Master Plan and other crucial and interrelated water management programs.

None of this should be surprising nor should it be viewed as an argument against taking bold and effective action. To the contrary, by stitching together the costs of the multiple lines of defense and examining how those costs play out over time, the fabric of a truly comprehensive financing plan can be formed. At least five responsibilities fell outside the scope of the 2012 Master Plan budget but will have major budgetary implications for both state and local authorities. These responsibilities must be factored into any comprehensive financing plan:

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[7] (1) Gulf of Mexico Energy Security Act (GOMESA), (2) Energy and Water Act (Corps Funding), (3) Coastal Wetlands Planning Protection and Restoration Act (CWPPRA), (4) Deepwater Horizon Natural Resources Damage Assessment (NRDA), (5) Deepwater Horizon Clean Water Act Penalties, (6) Carbon and Nutrient Credits, (7) Future State Funding, and (8) Louisiana's Coastal Protection and Restoration Fund. 2012 Master Plan, 93.

[8] 2012 Master Plan, 93 (stating "Given that we need to tie our plan to a budget, we evaluated the funding we may be receiving and determined that we could expect between $20 and $50 billion *(in present value dollars)* over the next 50 years. This is the funding amount that we believe has a good chance of coming to the state from various state and federal sources between now and 2061 . . . Because of the large scale needs of Louisiana's coast, the 2012 Coastal Master plan is based on a budget of $50 billion. This is the upper end of our estimates and better reflects the scope of the challenge facing Louisiana.") (emphasis added).

[9] Greater New Orleans Urban Water Plan: Implementation, 92; available at www.livingwithwater.com.

[10] We should point out that the cost and benefit estimates in the Urban Water Plan are also stated in present value dollars and are not based on the level of project design that underpins the 2012 Master Plan. (Greater New Orleans Water Plan: Implementation, 95). Without that additional detail, we cannot do the same inflation adjustment for the Urban Water Plan.

**Inflation**

Ronald Reagan once said that, "Inflation is as violent as a mugger, as frightening as an armed robber and as deadly as a hit man." [11] Though President Reagan was speaking of the national economy, his admonition is just as apt for the 2012 Master Plan. As noted earlier, the $50 billion price tag for the 2012 Master Plan was estimated using 2010 dollars.[12] As a benchmarking technique, there is absolutely nothing wrong with that, but financial planning requires that we think in terms of dollars, time, and inflation. Simply put, inflation matters.

The 2012 Master Plan contemplates expenditures at a rate of $1 billion per year.[13] Factoring in a conservative inflation rate of 2.4% (the average rate for the period 2004-2013, according to Bureau of Labor Statistics data)[14] over those 50 years, the adjusted cost of the 2012 Master Plan becomes $94.7 billion.[15] Using an inflation rate of 3%, the total would jump to $113 billion.[16] Admittedly, if dollars flow into the protection and restoration effort sooner rather than later and are allowed to be invested, the gap between revenues and expenses can be narrowed. Similarly, to some extent, inflation of costs may be offset by inflation of the broader economy and tax base. Those offsets, however, are not a given in coastal Louisiana nor in the realm of public works, which have not seen key agency budgets keep pace with inflation.[17] Nonetheless, the fact remains that without understanding the role of inflation on the largely nonrecurring revenue streams and on the few recurring but capped revenue streams, the odds that there will be a major revenue short fall will rise to a near certainty.

**Federal Hurricane Protection Levees**

The 2012 Master Plan identifies 33 "structural protection" projects in its $50 billion plan.[18] Such projects include earthen levees, concrete walls, floodgates, and pumps.[19] However, the 2012 Master Plan excludes from its budget consideration of all "federal levees."[20] The fact that these costs are excluded does not mean the costs can be avoided. The construction of federal levees are generally subject to a cost-share mechanism, whereby the non-federal sponsor must contribute anywhere between 15-

[11] Reagan, Ronald; available at www.brainyquote.com/quotes/quotes/r/ronaldreag125910.html (last accessed Aug. 7, 2014).
[12] 2012 Master Plan, 93.
[13] 2012 Master Plan, 93 (stating "For our work on the master plan, therefore, we are estimating that our coastal program will receive between $400 million and $1 billion a year for the next 50 years.").
[14] U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index: Consumer Price Index History Table (February, 2014); available at www.bls.gov/cpi/cpifiles/cpiai.txt (last accessed Aug. 7, 2014).
[15] ∑($1,000,000,000*1.024^n) where n=0, 1, 2, 3 . . . 50.
[16] ∑($1,000,000,000*1.03^n) where n=0, 1, 2, 3 . . . 50.
[17] National Academy of Public Administration. *Prioritizing America's Water Resources Investments: Budget Reform for Civil Works Construction Projects a the U.S. Army Corps of Engineers*, 11 (February 2007); available at file:///C:/Users/waterlaw/Downloads/CORPS_Full_Report_February_2007.pdf (last accessed August 11, 2014).
[18] 2012 Master Plan, 70.
[19] Id.
[20] Id. at 93.

50% of the total project cost. Furthermore, once a levee project is complete, responsibility for operations, maintenance, and rehabilitation is generally turned over to the non-federal sponsor. With relative sea-level-rise in coastal Louisiana at 0.36 inches per year (and in some areas significantly higher), these "federal" levees will need to be lifted regularly in order to maintain their flood protection capacity. These costs, while difficult to estimate, can be significant.

**Navigation Channel Bank Maintenance**

Expenditures for navigation channel bank maintenance for federally authorized navigation projects are explicitly excluded from the 2012 Master Plan budget because of the federal government's purported responsibility. However, a review of applicable laws and authorizations does not reveal any basis for asserting that the Federal government has any such affirmative duty to maintain channel banks. In fact, if anything the general rule is the opposite, with the federal government having duties with regard to channel maintenance but not bank maintenance. [21]

Navigation projects in Louisiana have come under federal purview via numerous acts of Congress for more than a century. The specifics of the projects are set forth in reports from the U.S. Army Corps of Engineers (USACE), which are referenced in the authorizing acts of Congress. In some cases, such as the Gulf Intracoastal Waterway, the total project is approved in pieces over decades. The delineation of maintenance responsibilities will likely be found in the act(s) that approved the project and the USACE report that contains the details of the project. In other cases, local authorities constructed the navigation projects, after contracting with land owners for canal rights-of-way. In those cases, even though the federal government subsequently assumed general maintenance and operations duties, responsibility for maintaining channel banks might be found in those canal rights-of-way contracts.

Such an involved investigation and analysis is not mentioned in the 2012 Master Plan. While this does not mean that the LACPRA is on the hook for ongoing bank maintenance, state and local authorities cannot assume that the federal government will foot the bill.

**MRGO Ecosystem Restoration—An Open Question**

In the wake of Hurricane Katrina, Congress told the USACE to devise a "comprehensive plan" to deauthorize the Mississippi River-Gulf Outlet and appropriated up to $20.2 million to "restor[e] the surrounding wetlands through measures to begin to reverse

[21] Davis, Mark. "Summary of "Federal Responsibilities for Navigation Channel Bank Maintenance," November 9, 2011, Tulane Institute on Water Resources Law and Policy.

wetland losses in areas affected by navigation, oil and gas, and other channels."[22] Importantly, this wetland restoration was to be done "at full Federal expense."[23]

In 2007, Congress then expounded on the deauthorization project, mandating that the Secretary of the Army "restore and protect the ecosystem substantially in accordance with [the restoration] plan . . . if the Secretary determines that the project is cost-effective, environmentally acceptable, and technically feasible."[24] While the USACE acknowledges this mandate, it takes the position that the project is subject to the general 65% federal – 35% non-federal cost-share structure under Section 103 of the Water Resources Development Act of 1986.[25] A 2012 USACE MRGO Ecosystem Restoration Plan abstract states that, "The State of Louisiana has been identified as potential non-Federal sponsor. However, the state disagrees with the USACE over the cost-share requirements for implementation and has expressed unwillingness to participate unless it is undertaken at full (100%) federal cost."[26] That abstract demonstrates the USACE's position on the matter, which must be reconciled with the State's position before any restoration money flows for that area. Any future appropriation for such restoration projects could be expended on other USACE projects if an agreement between the State and USACE is not in place.

**Secondary Costs**

Citing the inability to develop realistic estimates due to time constraints and the lack of sufficient specificity for construction projects, the 2012 Master Plan does not include "secondary cost considerations" in the $50 billion budget.[27] Secondary cost considerations include, but are not necessarily limited to, "community relocations, mitigation, [and] dredging costs from induced shoaling that may occur as a result of project effects."[28] To be fair, the 2012 Master Plan acknowledges that these cost conditions must be explored as the large-scale projects in the Plan move forward.[29] Their mention here is simply a reminder that secondary costs are just as real as primary costs and must be factored into any comprehensive financing plan.

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[22] 120 Stat. 454, Department of Defense – Civil, ch. 3, para. 2 (June 2006); available at file:///C:/Users/waterlaw/Downloads/092_Jun_2006_Public_Law_109-234.pdf (last accessed Aug. 15, 2014).
[23] Id.
[24] Water Resources Development Act of 2007, 121 Stat. 1281, § 7013; available at www.gpo.gov/fdsys/pkg/PLAW-110publ114/pdf/PLAW-110publ114.pdf (last accessed Aug. 15, 2014).
[25] Chief's Report regarding the "Mississippi River Gulf Outlet Ecosystem Restoration, Louisiana", 4 (Sept. 28, 2012); available at www.mrgo.gov/products/MRGO%20Chief's%20Report%20Signed%20and%20Dated%20092812.pdf (last accessed Aug.7, 2014).
[26] Mississippi River Gulf Outlet (MRGO) Ecosystem Restoration Plan, U.S. Army Corps of Engineering, June 14, 2012; available at www.usace.army.mil/Portals/2/docs/civilworks/CWRB/mrgo_eco/mrgo_eco.pdf (last accessed Aug. 7, 2014).
[27] 2012 Master Plan, Appendix A, A-49; available at www.lacpra.org/assets/docs/2012%20Master%20Plan/Final%20Plan/appendices/Appendix%20A_Project%20DefinitionsFINAL_wTpg.pdf (last accessed Aug. 7, 2014).
[28] Id.
[29] Id.

**Conclusions**

The cost of restoring ecologic integrity to coastal Louisiana and providing a measure of meaningful flood protection to the area's residents as well as local and national economic assets will be a massive and expensive undertaking, albeit a worthwhile one assuming the available time and relative sea level rise rates are within the ranges assumed in the 2012 Master Plan. With that said, the cost of implementing those measures will exceed the $50 billion figure set forth in the Plan, in all likelihood by a factor of at least two. When one includes the anticipated costs of the Urban Water Plan, federal flood protection, and other factors excluded from the 2012 Master Plan, the cost of restoring this coast and protecting its people can be expected to exceed $100 billion over 50 years.[30] The reasons for this lie primarily in the 2012 Master Plan's use of 2010 dollars instead of inflation adjusted dollars and the exclusion of a range of projects and programs from the Plan's cost estimates. The use of present value dollars in the 2012 Master Plan and the Urban Water Plan was neither hidden nor inappropriate as a methodology, and no criticism of that methodology is intended. However, when looking forward to the challenge of financing everything that is planned and necessary, a more comprehensive approach must be used.

None of this should be taken to chill the efforts of many to restore the coast. The value of keeping this coast ecologically and economically in business has been repeatedly demonstrated to be immense and well in excess of the adjusted price of the 2012 Master Plan.[31] The price of putting the pieces of coastal Louisiana and the Gulf Coast back together after Hurricanes Katrina and Rita alone approached $100 billion.[32] Knowing what is at stake and coming to terms with the true costs of saving coastal Louisiana are prerequisites for a robust civic conversation about how best to finance it. It will require engagement at the local, state, and national levels from a broad range of public and private stakeholders, and answers will not come easily. And while answers are possible where there is civic will and technical feasibility, pursuit of those answers will have to begin at home.

[30] $97 billion inflation-adjusted budget for a baseline implementation of the 2012 Master Plan plus $6.2 billion (in 2012 dollars) for implementing the Greater New Orleans Urban Water Plan in addition to the construction cost-share for federal levees, operations and maintenance for federal levees, secondary costs of projects proposed in the 2012 Master Plan, navigation channel bank maintenance, and potential cost-share for MR-GO ecosystem restoration.

[31] See Ryan, Tim. *The Economic Impact of Coastal Restoration and Hurricane Protection* (March 2014); available at www.law.tulane.edu/uploadedFiles/Institutes_and_Centers/Water_Resources_Law_and_Policy/Content/The%20Economic%20Impact%20of%20Coastal%20Restoration%20and%20Hurricane%20Protection%20by%20Dr%20Timothy%20Ryan%20FINAL%20V2.2.pdf (last accessed Aug. 11, 2014).

[32] "The Federal Government's Spending and Tax Actions in Response to the 2005 Gulf Coast Hurricanes," Congressional Budget Office, 1 (Aug. 1, 2007); available at www.cbo.gov/sites/default/files/cbofiles/ftpdocs/85xx/doc8514/08-07-hurricanes_letter.pdf (last accessed Aug. 7, 2014).