Conservation Investment Blueprint Case Study: Environmental Impact Bond for Green Infrastructure

Developed based on the Case Study for Coastal Resilience in Louisiana by Environmental Defense Fund

i. Overview of the conservation need and opportunity

Coastal communities in the US and around the world are grappling with the effects of climate change and natural hazards, such as more frequent and damaging storms, erosion, and sea level rise. Many communities have begun planning to reduce these threats. Those plans increasingly include restoration of natural infrastructure -- wetlands, forests, beaches, dunes, etc. – due to their flood risk reduction, water quality protection, and wind and wave dampening capabilities.

Demand for public funds to reduce flood risks already far outstrips availability, and existing funds need to be used as efficiently as possible. Tools that use available financing more efficiently and attract new payors to restore natural capital are needed to help improve coastal resilience in the US and around the world.

The world's major deltas in particular, are ecological and economic powerhouses and home to 365 million people. Louisiana's Mississippi River Delta is among the most vulnerable areas in the United States and has been losing, according to the U.S. Geological Survey[1], an average of 16.6 square miles of land a year from 1985 to 2010. Recent efforts on the part of Louisiana's Coastal Protection and Restoration Authority (CPRA) to curb land loss are successfully slowing that rate of land loss but land losses still pose a direct risk to as much as $3.6 billion in assets that support $7.6 billion (in 2015 3ollars) in economic activity each year. Loss of coastal wetlands reduces their storm protective services; increasing damage from a single storm by as much as $138 billion and generating an additional $53 billion in lost economic output from storm disruptions (according to a 2017 report by Louisiana State University[2]. Louisiana's coastal and US economies are strongly linked, and land loss and increased storm damage have far-reaching socioeconomic repercussions as the delta's infrastructure supplies 90% of the nation's outer continental oil and gas, 20% of the annual waterborne commerce, and 26% (by weight) of continental US commercial fisheries landings[3].

Scale and scope of activities required to address conservation need/opportunity

To address these growing storm impact and land loss concerns, Louisiana's CPRA developed a robust 50-year $50 billion Coastal Master Plan (CMP) that guides actions to sustain their coastal ecosystem, safeguard coastal populations, and protect vital economic and cultural resources. While Louisiana is expecting significant Deepwater Horizon oil spill-related funds for restoration in the next 15 years, as well as annual funding from the Gulf of Mexico Energy Security Act (GOMESA), the State has not identified funding for all of its planned natural infrastructure restoration.

As each day passes, construction costs and sea levels continue to rise as the delta subsides. Even under the most optimistic scenario, according to a 2016 study by the Water Institute of the Gulf, the price tag for restoring an acre of Louisiana wetlands will more than double in the next 20 years[4]. Therefore, the State needs to both make efficient use of known resources and identify additional sources to complete the CMP.

While amplified, the climate adaption and coastal resilience needs of Louisiana are not unique. Each Gulf of Mexico state was impacted by Deepwater Horizon oil spill, has natural infrastructure restoration needs, and have been developing plans to access spill-related funds. Private capital could provide funds to restore the coast earlier to generate costs savings and realize environmental and risk reduction benefits sooner. When projects are constructed sooner in the planning horizon there is the added benefit of preventing future loss of additional wetlands by protecting wetlands that would otherwise become exposed.

Where benefits of coastal resilience projects can be quantified and beneficiaries identified, an EIB can be a mechanism for attracting other public and private parties to assist with repayment of the bond. Benefits of coastal resilience projects can be those associated with restoration of natural habitat – such as improved fisheries and hunting, climate mitigation, water quality protection or improvement, and flood damage reduction.

ii. Describing how the Blueprint contributes to conservation goals

Contributions to Conservation Goal

This Coastal Restoration EIB case study supporting the EIB Blueprint contributes to the conservation and enhancement of natural coastal infrastructure by accelerating its restoration and introducing a mechanism to attract private investment in restoration. Coastal wetlands are nurseries for marine fish, provide food sources, and improve water quality to contribute to marine ecosystem biodiversity and improve ecological and economic resilience in the coastal zone. Restoring other natural coastal infrastructure, such as dunes and maritime forests, and oyster reefs, can provide similar conservation benefits to the coastal zone.

An EIB has three components of repayment to investors: principal, interest or coupon, and a "performance payment" tied to the achievement of desired project outcomes. An EIB can take the form of a bond (issued publicly or in private placement), or it can be a loan or note. Investors purchase the bond and provide upfront capital to allow restoration projects to be built sooner. Private stakeholders in one of the project's co-benefits – in this case, land loss reduction and flood risk reduction – can join the transaction as partner-payors by providing a "performance payment" in the event of a successful project outcome. For more complex transactions, these additional partner-payors could provide some portion of repayment (interest or principle).

Properly designed, EIBs can result in restoring coastal habitats earlier to generate additional environmental and risk reduction and resiliency benefits, while generating costs savings that can be used to fund other coastal restoration projects.

Key Metrics

Because pay-for-performance is a critical element of an EIB's design, establishing appropriate metrics is essential. Each EIB will have its own metrics of success based on its performance goal and against which performance is measured to influence the rate of return to investors.

The EIB will be centered around a primary outcome metric that is tied to repayment. Various performance tiers can be set – such as base/expected performance, under-performance, and over-performance. Each of these scenarios would result in a different level of return to investors – generally, the less successful the project, the less issuers provide a return to investors.

In the case of an EIB for Louisiana wetlands restoration, the proposed metric was avoided land loss as a proxy for flood risk and flood damage reduction (which would require a storm during the evaluation period) and comparison to a similar site. Reducing Mississippi river delta wetland loss and protecting coastal communities are key goals for the state's Coastal Master Plan.

Potential metrics for the outcome of a coastal habitat restoration project would depend in part on the desired outcome stipulated by the project sponsor (e.g., a state agency) and of sufficient interest to beneficiaries that they commit to some portion of bond repayment. Possible metrics could include evidence that wetland soils are accreting (i.e., evidence the wetland will be able to sustain itself for a reasonable period), increased numbers or biomass of desired fish or waterfowl species, and reduced frequency of nuisance floods, or lowered infrastructure maintenance costs. The size of the project and the ability of beneficiaries to pay will dictate which outcomes make sense to measure.

A CPIC-branded investment blueprint needs to demonstrate clear and measurable impacts on biodiversity conservation. This can happen through interventions that are designed to ameliorate threats to biodiversity, at the species or ecosystem level. Influence over the delivery of ecosystem flows that benefit people is also desirable.

Threats to biodiversity can be assessed at a spatial scale using the Integrated Biodiversity Assessment Tool (https://ibat-alliance.org). The first step is to assess what biodiversity assets exist in proximity to project sites using the proximity tool of IBAT. Once threatened species, Key Biodiversity Areas and protected areas in the vicinity of the site are identified, then each of these have listings of threats to biodiversity that can be influenced by the investment opportunity. An example would be the reduction in pollution of biodiversity-rich rivers from investments in reforestation.

A clear statement of the planned reduction in threats to biodiversity that will be generated by the investment is necessary to justify priority status as a CPIC blueprint. In the first stage of project development, a simple assessment of the project proximity to biodiversity asset and the link between the impacts of investment and the reduction of threats is sufficient. Once investment activity is confirmed, a more detailed assessment of potential return on investment for biodiversity is required. A module to calculate this is under development for IBAT. This biodiversity return on investment can be calculated ex-ante, as a means of assessing opportunities for impact, and ex-post, once the investment is confirmed and management starts.

A first assessment of the impacts of the investment on ecosystem services to people can be made through the use of the TESSA tool (http://tessa.tools). A more detailed assessment of the tools available for conservation assessments, forest landscape restoration planning landscape assessment generally, and biodiversity management is available in the Conservation Investment Blueprints: A Development Guide available on the CPIC website (http://cpicfinance.com/related-reports).

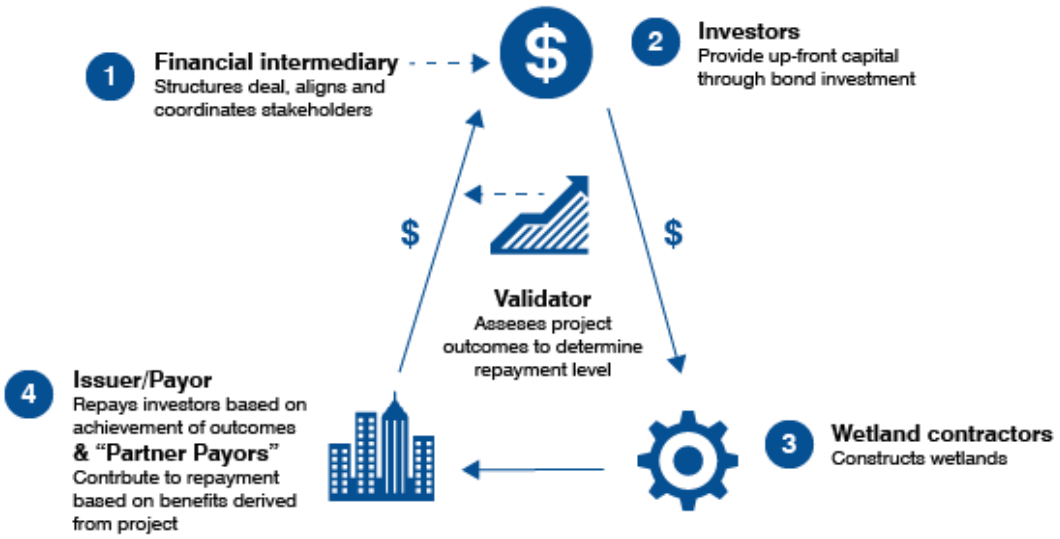
Outcomes

Ultimately, with replication, coastal resilience EIBs will expand restoration of natural infrastructure by demonstrating their benefits of reducing coastal communities' vulnerability to storms and sea level rise as well as their ability to attract additional bond payors. Increased project size and replication will improve the overall economic and environmental resiliency of coastal communities.

iii. The business model

Organisation and governance

A coastal resilience EIB will be used to fund an environmental service provider (e.g., a wetland restoration contractor) to restore natural infrastructure in coastal Louisiana. Revenue from natural resource leases, court settlements, and beneficiaries of ecosystem services will pay based on the performance success of the restoration.



Delivery capacity required, relevant stakeholders identified

Environmental Impact Bond Issuer/ Outcome Funder"): Proposed: Louisiana's Coastal Protection and Restoration Authority (CPRA), the government entity with a conservation need.

Financial Intermediary: To be determined. Will aggregate funds from private and nongovernmental **Payor (also called an "**

investors to provide the upfront capital required by a service provider to deliver services over the life of a PFS contract. They underwrite the bond transaction, manage the flow of money, aggregate funds of investors, and counsels investors.

Investors: To be determined. All investors defined by Regulation D of the 1933 Securities Act. Impact Investors, Financial institutions, banks, groups, or individuals that provide capital to address the conservation need based on environmental, social, and governance outcomes may have a stronger interest.

Wetland contractor: The to be determined service provider selected by CPRA via a procurement process. The private firm(s) whose business line includes provision of natural infrastructure restoration services. In charge of construction, operations, product/service delivery.

Validator: To be determined**.** Third-Party monitoring and evaluation of the ESG Goal. Conducts monitoring and evaluation to determine whether target outcomes have been met and can be academic or research institution or some other agreed to trusted party.

Partner-Payors: To be determined. The entity(ies) responsible for paying back investors for their investments based on pre-defined achievement of outcomes. Potential back-end payors are those industries, major land owners, philanthropies or other government entities that would either benefit from the flood risk reduction provided by the restoration project or are committed to demonstrating the concepts in this pilot to encourage greater private sector participation in financing coastal restoration that reduces flood risks in the longer-term.

Environmental NGO: Environmental Defense Fund: Helps to identify and recruit payor-partners. Assists with external communications that attract interest from the private finance community. Can help coordinate the deal and align all the stakeholders and help structures the performance based incentives. Brings technical expertise that helps to establish the environmental or "green" credentials of the project and bond.

Products and services being sold

An EIB to fund wetland restoration in coastal Louisiana. The product will be similar to a municipal bond, possibly tax-exempt, but with two performance tiers – "base performance" and "over-performance" tied to environmental and resilience outcomes.

Revenue Model

Revenue with which to pay back a wetlands restoration EIB could come from existing tax bases (e.g., levee districts, sales taxes, tourism taxes, user fees, etc.), revenue from on- and offshore oil and gas leases, court case settlements (e.g., criminal and civil damages for oil spills or flood damages), and anticipated funds associated with natural resource damages (e.g., Natural Resource Damage Assessments or the RESTORE Act). The scale of revenue needed is defined by the project and the willingness of the project sponsor to bond its revenue stream(s).

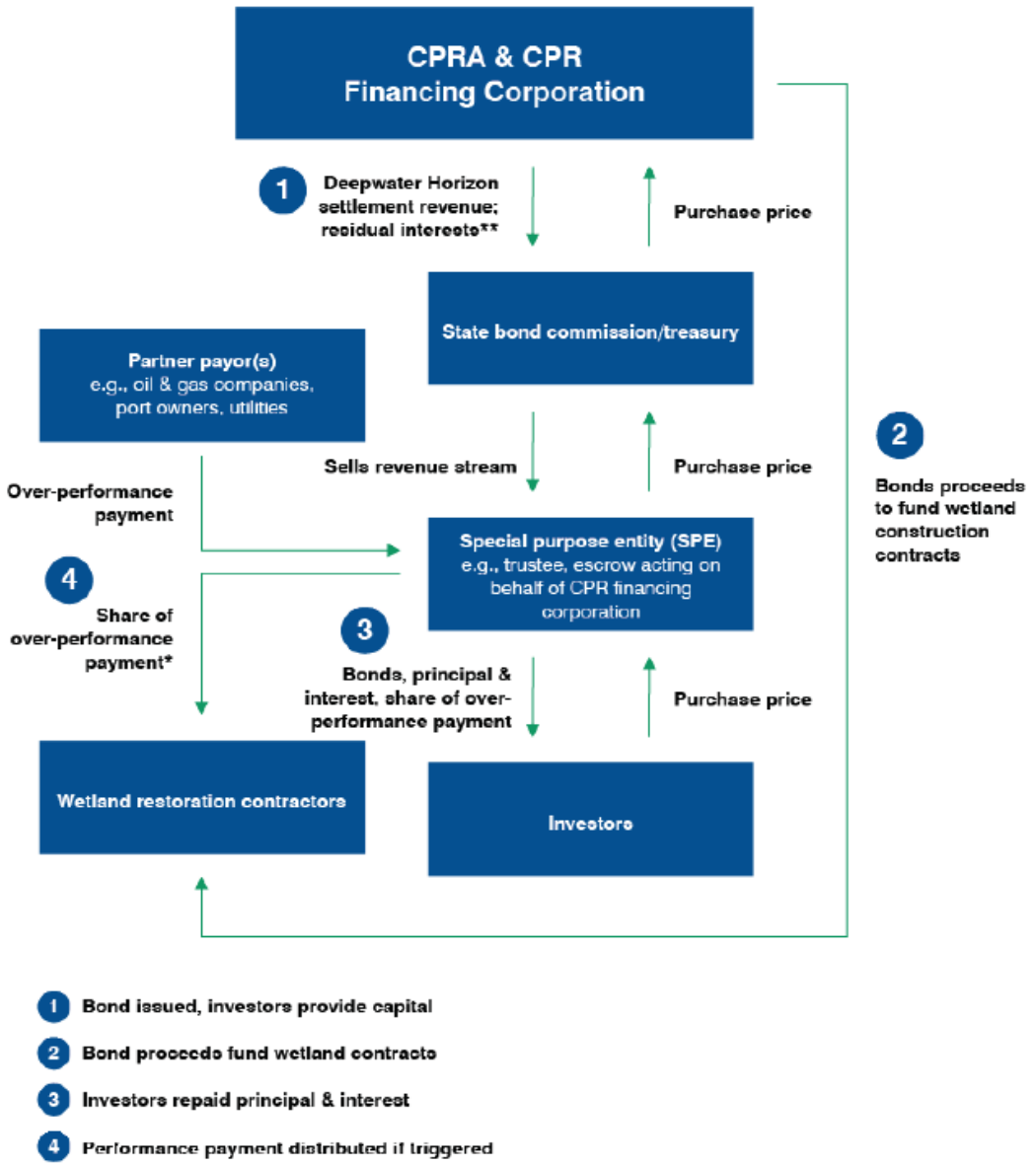
Revenue could also come from those directly benefiting from ecosystem services provided by the project. Once use of the EIB is expanded, revenue might come from large land owners (such as the oil and gas industry or home-owner associations or special districts) or inland water way users – anyone whose vulnerable coastal properties, operations, and livelihoods are protected by healthy wetlands.

Projects with similar performance objectives can be combined into a single EIB.

In the case of the Louisiana Coastal Resilience EIB, likely revenue sources for repayment of the bond are funds associated the Deepwater Horizon Oil Spill damages; and partner-payor contributions to the performance payment, interest, and/or principal.

Cash flows and commercial sustainability

Proposed Louisiana EIB transaction structure



* The amount of over-performance payment, if any, is contingent upon achievement of a to-be-determined measurement of flood risk reduction.
** According to CPR Financing Corporation's enabling legislation La. R.S. 39:99:25 to 99.100, residual interests are " the income of the coporation, and bond proceeds, if any, not previously paid to the state, that are in excess of the corporation's requirements to pay its operating expenses, debt service, sinking fund and other redemption requirement, reserve fund requirements, and any other contractual obligations to the holders or that may be incurred in connection with the issuance or repayment of the bonds.

Benefits To EIB Issuer: Louisiana CPRA (proposed)

Benefits from achieving restoration earlier and at lower anticipated cost. Earlier restoration is expected to slow land loss at adjacent protected sites and reduce costs associated with flooding events. Issuer also benefits from attracting new partner-payors, which can lower the issuer's costs and allow state resources to be spent on other projects or additional wetland restoration.

Benefits to Investors

The EIB is intended to be market based so that investors receive interest risk-adjusted at market value. A performance payment is made to investors when performance achieves a high threshold. Incentivizing outcomes ensures ESG goals are met (which is especially important to impact investors).

Benefits to Partner-Payors

The bond is intended to attract private sector or other partners to become payors based on a service provided by the restored wetland – such as reduced flood threat and reduced flood damages. The structure of the deal considers the benefits they receive (e.g., less business interruption, maintenance of property values, avoided costs of road repairs, decreased operation and maintenance costs, etc.) from having the project built sooner.

Benefits to Environment and Society

Environmental outcomes achieved faster, building resiliency to climate change such as increased intensity of storms, rising sea levels, and flooding.

Benefits to service providers

The service provider (an environmental restoration firm) profits through their contract that is funded by the bond. The contractor is responsible for meeting certain performance targets. Often in the case of wetland restoration such targets are defined in terms of acreage of wetland, ratio of wetland to open water, sediment depths, species composition, etc.; meeting them results in payment of the contract. With the Coastal Resiliency EIB, exceeding an outcome-based performance threshold (e.g., adjacent land loss rates are lessened by a defined percentage) results in the service provider receiving an additional payment. Beyond financial remuneration, the service provider also gets a reputational bump.

External dependencies

Regulation	No regulatory requirement is needed to incentivize action to be taken on the wetland restoration in Louisiana, or other areas coping with land loss and sea level rise.
Risk Assessments	Project operation and environmental risk assessment from technical advisors and financial intermediaries during underwriting and by rating firms set the bond rate and evaluate the shared risk between the bond issuer and investors. This establishes the bond rate which can affect the affordability of the project or it's time table.
Construction Firms Expertise	Access to qualified providers of construction or services of conservation goal.

Risk management

Risk	Mitigation Strategy
Performance Risk of Environmental Outcomes	The pay for success model allows impact investors to share the risk involved in an innovative solution such as wetland restoration to reduce flood damage risk. By structuring a contingent payment based upon achievement of superior effectiveness, the bond issuer is focusing on outcomes in addition to outputs. Hiring of construction firms with experience and training and defining the right goals can provide risk management by scientific based consultancy and local expertise.
Performance Risk of Social and Governance Outcomes	Transparency in the contractor selection and employee hiring process with established qualifications on local firms and with local employees. Annual reporting on bonds, as required by the Green Bond principles, is on what revenue is received and placed into the project that is independently audited.

Regulatory Risk	The regulatory risks perceived with the Louisiana Coastal Resiliency EIB are associated with approvals to proceed with construction and delay project completion times and increase costs. The service provider and/or the state will secure necessary permits.
Weather and Climate Change	Severe weather during the construction phase could delay completion times. Contracts between the state and service provider will have *force majeure* clauses to address the effects and responsibilities in the event of storms and storm damages during construction and monitoring phases. Scientific based understanding of the effects of extreme weather and climate change in the planning phase, and weather insurance by the constructing firm could mitigate these risks.
Government Default Risk	An investor risk. Risk-rated interest based on the seniority of the bond and the rating from agencies mitigates this risk with investors. Since lower seniority bonds would require higher rates of return, motivation remains to keep the bonds at senior or subordinate debt levels for lower rates. This incentivizes governments to pay bond holders first.

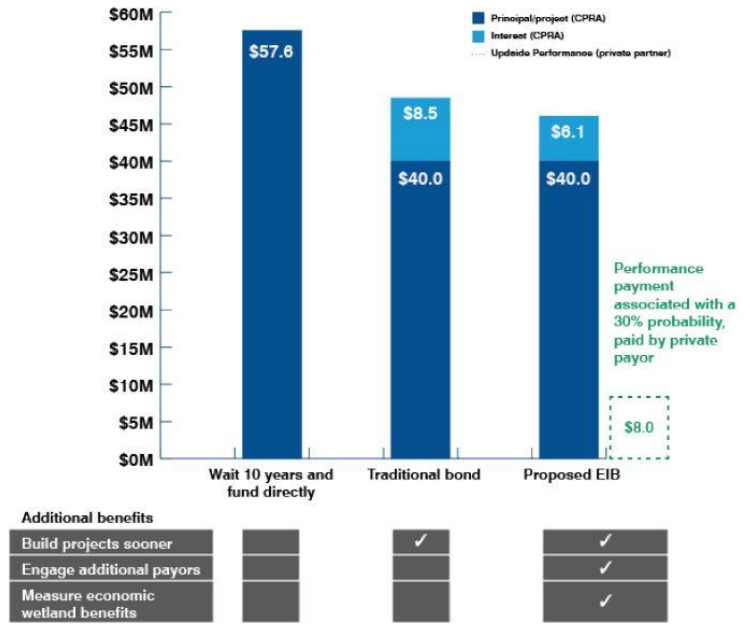
iv. The investment model

The financial instruments being sought to fund the business model

This revenue-based Environmental Impact Bond is designed to accelerate planned coastal wetland restoration to save government sponsors' funds that can then be deployed to additional wetland habitat restoration projects. It is also designed to attract private sector involvement by project beneficiaries as payor-partners; payor partners would provide the performance payment or possibly some portion of interest and principal.

A $40 million EIB could realize approximately 600 acres of wetland restoration ten years earlier to save the issuer $20M. This savings comes from avoiding increased costs of wetland restoration due to relative sea level rise (which would require that more sediment be found, pumped and placed into the wetland) and inflation of overall construction expenses. Involvement of payor-partners in provide the performance payment in effect reduces the interest rate charged by investors. This upside performance payment could be between $3.5 million to $8 million (with one $1 million of that provided to the service provider than the remainder to investors).

Illustrative comparison of CPRA costs of waiting to fund projects bond and pursuing the proposed EIB



The relative size of these instruments and basic information on their terms

$40 million. Anticipated tenor is 10 - 15 years but will be determined during transaction execution.

Investor types and the finance they provide at different stages of project maturity

The EIB will be designed to be attractive to impact investors and may also attract institutional and commercial banks.

Risk mitigation instruments used and how these were incorporated into the investment structure

Pay for Success: A performance payment would be made if the environmental outcome exceeds an agreed upon threshold that establishes superior performance. The performance payment would be shared between the investors and the service provider. That threshold has not yet been determined for Louisiana coastal resilience.

The exit strategy employed

Because the bond is purchased in full by investors there is no exit option. The relationship with investors ends once final payment is made and that payment will be based on the overall level of success. Conservation benefits will continue after investor exit.

Innovative features of the investment model

A performance-based EIB allows for private sector stakeholders to partner with government to fund environmental restoration projects that slow land loss and reduce flood risks. The EIB would be an innovative application of a traditional bond product to help communities adapt to climate change.

Replicability and Scalability

Coastal resilience EIBs could be used in locations where coastal, wetland, and waterway protection and conservation will help reduce land loss and flood risks. The Louisiana coastal resilience bond could be readily expanded or replicated to other locations on the Louisiana coast and to other locations with similar revenue streams and coastal conditions. The basic concepts used in this EIB could be applied in many other circumstances across the globe.

Acknowledgements

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Works Cited

1. Couvillion, B. R., Barras, J. A., Steyer, G. D., Sleavin, W., Fischer, M., Beck, H., Heckman, D. (2011). *Land Area Change in Coastal Louisiana from 1932 to 2010* (p. 19). Reston, Virginia. https://biotech.law.lsu.edu/blog/SIM3164_Pamphlet.pdf
2. Barnes, S. R., & Virgets, S. (2017). *Regional Impacts of Coastal Land Loss and Louisiana's Opportunity for Growth* (p. 44). https://www.edf.org/sites/default/files/LSU-EPRG-Regional-Economic-Land-Loss-Risks-and-Opportunities-2017.pdf
3. What's at Stake? The Economy of Louisiana. (2018). http://mississippiriverdelta.org/whats-at-stake/economy/
4. White, E. (2016, September). Future Costs of Marsh Creation Projects in Coastal Louisiana - Water Institute. Retrieved May 21, 2018, from https://thewaterinstitute.org/reports/future-costs-of-marsh-creation-projects-in-coastal-louisiana