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Restoring the Mississippi River Delta in Louisiana Ecological Tradeoffs and Barriers to Action

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Restoring the Mississippi River Delta in Louisiana Ecological Tradeoffs and Barriers to Action

A Thesis

Submitted to the Graduate Faculty Of the
University of New Orleans
in partial fulfillment of the
requirement for the degree of

Master of Science in Urban and Regional Planning

By
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B.A. University of Los Angeles California 2008
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Abstract

This study investigates the Louisiana 2012 Coastal Master Plan's ability to reconcile conflicting economic and ecological demands on coastal resources. The Louisiana Coastal Master Plan was unique in combining flood control and coastal restoration under one authority. However, the objectives of flood control and coastal restoration can be in conflict. The plan was also unique in its approach of restoration from a working coast perspective. However, the objectives of ecological restoration and economic productivity do not always agree. By conducting semi-structured interviews with major coastal stakeholders, this research will explore how the planning process has accommodated the views and values of key stakeholder parties. This research aims to make more transparent the inherent environmental tradeoffs of restoration from a working coast perspective. A working coast is a compromise between economic and environmental stakeholder needs. The approach requires a balance of power to ensure that the projects selected best serve the needs of all parties. The study found that while there is industry buy in, mechanisms for mitigating economic externalities is lacking in the plan, corporate infrastructure benefits while wildlife resources are in decline.

Key Words: Louisiana 2012 Coastal Master Plan; Stakeholder; Working Coast; Ecological Tradeoffs; Coastal Land Loss; Project Selection; Louisiana Coastal Zone; Coastal Restoration; Planning Process.

Chapter 1 Introduction

Coastal restoration is a complex issue. The causes of land loss are well established. The benefits of restoration are also established. What is not straightforward is how to reverse eighty years of environmental externalities of economic development when the restoration plan seeks not just to restore the ecosystem, but also to preserve the activity that has destroyed it. The preservation of the region's economic viability motivates the Coastal Master Plan. Thus, it is important to examine the ecological tradeoffs of economically driven restoration. If we only restore the habitats that have human value, it is important to understand which species will benefit and which species will not. This study seeks to discover the needs and concerns of key stakeholder parties involved in the planning process through interviews. The study seeks to illuminate which project types serve the interests of different stakeholder groups, making more transparent which habitats or strategies may or may not be favored. Other studies have evaluated the Coastal Master Plan's planning process by looking at its effectiveness at reducing storm surge, or its ability to reduce land loss; however, this study investigates the plan's ability to reconcile conflicting economic and ecological needs on the declining wetland resources of the Louisiana coastal zone.

Framing the Problem

Economically driven environmental alterations allowed for the development of the lower Mississippi River delta and greatly diminished the wetland and flood plain environments of Louisiana. The channelization of the river through levees eliminated spring flooding and paved the way for the development of the flood plain (Costello, 2007; Keim et al 2006; McFalls et al, 2010). At the same time, this environmental alteration cut wetland and flood plain environments off from the river's fresh water and sediment load, and increased the risk of less frequent but more severe flood events (Costello, 2007; Keim et al, 2006; McFalls et al, 2010). The second environmental alteration that encouraged development of low elevation high flood risk land was the draining and conversion of swamps and marshlands to urban uses (Heerden and Bryans, 2006; Spruce, Smoot & Graham, 2009). Simultaneously the exploitation of oil and gas resources in the remaining wetlands created a vast network of oil and gas pipelines and canals that has accelerated land loss through saltwater intrusion (McFalls et al, 2010). Over time, these trends have resulted in an expansion of urban environments along the coast and the shrinking of the floodplain and wetland environments (Mark, 2010). The diminished state of the region's natural ecological buffer has reduced the ability for coastal communities to withstand storm surge and cope with flooding from hurricanes. The problem lies not just in the elevated flood risk experienced by coastal communities, but also in the conflicts of interest between ecological and economic concerns.

Louisiana has acknowledged the need for reversing the land loss trend and reducing flood risk in the Louisiana Coastal Master Plan. The Louisiana Coastal Master Plan attempts to restore some of the ecosystem services of the lower Mississippi River delta while maintaining the focus on a working coast, requiring some preservation of the environmental alterations around which the economy has developed. The plan's multiple lines of defense strategy attempts to balance engineered structures with restoration projects. The 2012 plan developed a robust planning process to inform project selection and prioritization. This process created focus groups to

represent the different economic and ecological concerns of the Louisiana coastal zone. Each group has a different set of needs and concerns for the region; however, all parties seek to reverse the land loss trend.

Research Focus

The multiple lines of defense strategy and the working coast approach to restoration imply a compromise between ecological and economic needs, resulting in tradeoffs and limitations to the plan. The focus of this research project is to explore how conflicting interests are reconciled in the plan. In particular, it seeks to make more transparent the types of projects that best serve the interests of different stakeholder groups, or may be counter to the interests of different stakeholder groups. Lastly, this research seeks to identify ecological tradeoffs of project selection and prioritization.

It seeks to answer the following questions.

1. What do stakeholders see as the best strategies for reducing flood risk and reversing land loss and why?
2. Do stakeholder parties feel that the plans project selection, prioritization, and overall scope adequately address their needs and concerns for the coast?
3. What are the economic and ecological benefits and tradeoffs of the plan?

Thesis Structure

This paper divides into six parts: an introduction, a literature review of relevant background information, methods and research design, a discussion of the findings for the economic stakeholders, a discussion of the findings of the environmental stakeholders, and the conclusion. Chapter One sets out to frame the problem and introduce the core research questions and motivations of this research. Chapter Two discusses relevant academic literature and background information on the history of flood control, land loss, coastal restoration, the Louisiana 2012 Coastal Master Plan and planning theory. Chapter Three explains the methods and research design of this research. Chapters Four and Five discuss the findings of the economic and environmental stakeholder groups. Lastly, Chapter Six gives the conclusions of the research.

Research Motivations

This study attempts to reveal stakeholder values to discover which types of restoration or flood mitigation projects serve the needs of different interest groups. Academic literature has established the causes of coastal land loss and the impacts of inaction. Studies have shown how the driving economic forces of Louisiana have shaped development patterns and created an imbalanced trend of ever-increasing land loss and flood risk where economic needs and concerns are at odds with ecological processes. This study is important because it poses a different question: What are the conflicts, tradeoffs, and limitations of coastal restoration from a working

coast approach rather than one focused solely on ecology? Though the Coastal Master Plan seeks to reverse the land loss trend, it is not a traditional restoration plan concerned with restoring ecological functions only. The incorporation of economic stakeholder values will also influence which habitats the plan restores. It is important to examine the ecological and economic tradeoffs of this planning approach to determine how well the plan has achieved a balance across stakeholder groups and between the economy and the environment.

Chapter 2 Literature Review and Background Information

Louisiana's economic forces have shaped a coastal environment where economic needs and concerns are competing with ecological needs and concerns in the state's efforts to reduce flood risk and reverse land loss. The economic focus of the plan will influence the types of habitats, natural resources and ecological processes restored. The state has a long history of restoration efforts; however, wetland habitat continue to convert to open water. The Coastal Master Plan is meant to be different than past efforts in its scope and in its economic focus. The plan has also made a concerted effort to be inclusive in its participation process.

Coastal Land Loss

The region developed with the belief that there could be artificial control of nature without severe consequence (McPhee, 1989). Planning decisions and economic investments made without concern for ecological consequences created an urban and economic infrastructure that is at odds with wetland and floodplain environments, while being dependent on the ecological services that they provide (Herd, 2010). Coastal Louisiana developed over thousands of years (Mark, 2010), building natural ridges, levees and barrier islands (Falkner et al, 2007). The natural vegetation of the region evolved to be sensitive to subtle differences in environmental conditions creating a bio-divers, but delicate ecology of marsh, swamps, and forested ridges (Keim et al, 2006).

Hard flood control measures such as levees starve the deltaic plain of sediment and fresh water, and disrupt the ecological functions of the flood plain and wetland environments, which cause them to erode (McFalls et al, 2010). Saltwater intrusion is another major cause of coastal erosion (Keim et al, 2006; Falkner et al, 2007). Oil and gas pipelines and canals, as well as the invasive nutria herbivore, are common causes of salt-water intrusion (McFalls et al, 2010). Furthermore, wetland erosion is occurring at the exterior of the coastal system with the narrowing and overtopping of barrier islands, and at the interior with the loss of back barrier bay and interior marshlands (Khalil et al, 2010).

Changes in hydrology have caused the land to subside; when coupled with rising sea levels this poses a great threat to wetland environments sensitive to discrete changes in elevation and water dynamics (Falkner et al, 2007). Projected mean global sea level expects a rise of 18–48 centimeters by 2050 and 50–140 centimeters by 2100 (Cooper et al, 2013). Elevated sea levels will raise the Mississippi River and exacerbate flood risk in coastal Louisiana (Dreissen & Van Ledden, 2013). Rising sea levels along with increased storm frequency and intensity will further erode wetlands, placing coastal communities at greater risk (Lopez, 2009; Murdikhayeva, 2013). In the event of a storm, coastal Louisiana faces multiple sources of flooding from both levee failure along the Mississippi River and from storm surge from the gulf, with much of the developed land at or below sea level (Dreissen and Ledden, 2013).

History of Coastal Restoration Efforts

The Coastal Master Plan is not the first piece of legislation that set out to address concerns about increasing flood risk and the rapidly declining state of wetland ecosystems.

However, before the Coastal Master Plan, state and federal action treated these two related issues as separate problems. Valuable lessons can be learned from past restoration efforts by looking at how and why past efforts failed to reverse the land loss trend, and asking whether the current plan addresses these shortcomings.

The first comprehensive federal flood control legislation for the Mississippi River was passed by congress in response to the 1927 flood (Barry, 1997). The 1927 flood was a national disaster of epic proportions, devastating a vast swath of states within the upper and lower Mississippi floodplain and its tributaries (Barry, 1997). As a result, coastal land loss dates back to the 1930s (CPRA, 2012). In 1970, scientists quantified coastal land loss after reports from local communities of disappearing wetlands and the encroachment of open water (America's Wetland: Resource Center). The Estuary Protection Act and the Coastal Zone Management Act passed in the 1970s showing a growing awareness about coastal land loss and the importance to protect wetland habitats (America's Wetland: Resource Center). In 1989 federal and state action specifically targeted land loss in Louisiana (America's Wetland: Resource Center).

In 1989, the state passed Act 6 to address land loss concerns (America's Wetland: Resource Center). Act 6 established a multi-agency coastal restoration authority funded by an oil and gas revenue trust fund (America's Wetland: Resource Center, 2015). In the same year congress passed the North American Wetland Conservation Act, and in 1990 the Coastal Wetland Planning Protection Restoration Act, CWPPRA, also known as the Breaux Act (America's Wetland: Resource Center). CWPPRA allocated seventy percent of federal funds for coastal restoration projects in Louisiana and created a multi-agency coastal restoration task force that included the US departments of Army, Interior, Agriculture and Commerce, the Environmental Protection Agency and the Governor (America's Wetland: Resource Center). CWPPRA also created The Louisiana Coastal Wetlands Restoration Plan that identified priority restoration projects by consulting universities, landowners and local government agencies (America's Wetland: Resource Center). The plan encouraged public / private partnership by requiring match for federal funds (America's Wetland: Resource Center). The plan resulted in 66 projects and spent approximately fifty million dollars per year over nine years (America's Wetland: Resource Center). While CWPPRA succeeded in bringing much needed attention and resources to coastal land loss, the piecemeal approach did not address the causes of the problem. As a result, land loss continues to be a problem for the region in spite of these efforts.

Coast 2050 was a restoration plan created in 1996 that called for the restoration of ecosystem functions and proposed the re-engineering of the Mississippi River to emulate natural fluvial and delta processes by creating sediment and fresh water diversions using pipes and canals to replenish wetland ecosystems (Coast 2050 Feasibility Study). It also set out to address salt-water intrusion up river (Coast 2050 Feasibility Study). The plan would have closed the Mississippi River Gulf Outlet, or MRGO, and restore barrier islands (Coast 2050 Feasibility Study; America's Wetland: Resource Center, 2015). Legislatively, the Coast 2050 restoration plan was separate from flood control. The bill would have cost fourteen billion dollars, a number the state perceived as being too expensive for a restoration project at the time (Coast 2050 Feasibility Study). Consequently, the MRGO shipping canal served as a funnel for storm surge during Hurricane Katrina, costing 200 billion dollars' worth of damage (Coast 2050 Feasibility Study), (America's Wetland: Resource Center, 2015). Though this plan would have addressed

the causes of land loss, the development of the plan was ecologically driven rather than economically driven, and failed to garner the political will and public buy-in necessary for the investment. Though previous restoration efforts were also environmentally focused they were on a smaller scale requiring less strategic buy in.

From 2000 to 2003, Louisiana and the Army Corps of Engineers performed a feasibility study for a seventeen billion dollar coastal restoration project based on Coast 2050 (Coast 2050 Feasibility Study). In 2004, the state commissioned the Louisiana Coastal Area Ecosystems Restoration Study, which led to the Water Resources Development Act or (WRDA) (America's Wetland: Resource Center, 2015). The 2007 WRDA authorized flood control, navigation, and environmental projects and studies (America's Wetland: Resource Center, 2015). The Louisiana Coastal Area program, or LCA, implemented smaller-scale, near-term, strategies drawn from the Coast 2050 plan (Coast 2050 Feasibility Study). The program included the MRGO Ecosystem Restoration Plan to close the channel and restore marsh, swamp, and oyster reefs. The program also included a plan to create two river diversions to convey sediment and fresh water to marshes such as the West Bay mid Barataria diversion, which has dedicated dredging. LCA includes fifteen projects with five in advanced stages of planning (America's Wetland: Resource Center, 2015).

In 2007 the state created the first Coastal Master Plan document to address concerns about flood risk and coastal land loss (CRPA, 2012). The state created the Coastal Protection and Restoration Authority, or CPRA, to oversee flood mitigation and restoration efforts together (CRPA, 2012). The plan was also different from past restoration efforts in its economic focus to restore a “working coast”. The state established a five-year cycle of scientific investigation aimed to guide future legislation and regulation for coastal restoration (CRPA, 2012). The 2012 plan is an improvement upon the 2007 plan passing as a fifty billion dollar bill (CRPA, 2012). The Restore Act of 2011 is a separate bill passed as a federal response to the BP oil spill in the Gulf. The bill sets out to restore coastal resources, ecosystems and economies impacted by the spill thus, supporting restoration efforts along the Louisiana coast.

Public perception supports the scientific consensus that storm risk increases as wetland ecosystems are degraded, and that wetland restoration is a viable strategy to provide protection from storms (Kim and Petrolia, 2013). The public’s “willingness to pay” for coastal restoration stems from this belief that restored marsh and swamp land, as well as barrier islands would provide a necessary support to existing levee infrastructure (Kim and Petrolia, 2013). However, the economic development of the region is rooted in the exploitation of coastal resources and the landscape has been altered to support economic activity such as navigation (Barry, 1998), urban/residential expansion (Heerden and Bryan, 2006), and oil and gas (Bowermaster, 2010), negatively affecting less invasive industries such as fishing, eco-tourism and recreation. These stakeholders recognize the need to reverse the land loss trend while some economic stakeholders have a vested interest in preserving the environmental alterations necessary to their industry.

The 2012 Louisiana Coastal Master Plan

The 2012 plan is a 50 year plan that sets out to reverse the land loss trend and reduce flood risk (CRPA, 2012). The plan has two types of projects, risk reduction projects and land

building projects (CRPA, 2012). Risk reduction projects include engineered structures such as levees and sea walls. Land building projects include hydrologic restoration, sediment diversions, barrier island restoration, and marsh creation (CRPA, 2012). The U.S. Army Corps of Engineers has used storm surge modeling to identify wetland habitats that slow down and hold back storm surge (Lopez, 2009). These natural features can be preserved and restored as a form of flood control (Lopez, 2009). The plan has given strategic stakeholders an active role in the planning process (Peyronnin, 2013). The framework development team included representatives from government, academia, representatives of major coastal industries, and environmental nonprofits (CRPA, 2012). Additionally, CPRA created stakeholder focus groups for the major economic industries in the coastal zone. CPRA also created a stakeholder focus group for private landowners (CRPA, 2012). CPRA used advisory panels of academic experts to inform the planning process (CRPA, 2012). The Coastal Master Plan used a computer-based decision-support tool, called the CPRA planning tool. CPRA uses this tool to choose the strategy that results in the greatest level of risk-reduction and land-building benefits within budget constraints; however, the strategy chosen is also required to adhere to objectives expressed by stakeholder groups (Groves and Sharon 2013).

The strength of the 2012 Coastal Master Plan is its long-range vision and its ability to incorporate economic, social, and environmental values into its project selection process to garner political will and public support. The plan has the potential to decrease the cost of damages incurred by storm surge while reducing land loss along the coast (Peyronnin, 2013). Furthermore, the multiple lines of defense strategy recognizes the intra-related nature of flood control and the restoration of wetlands by proposing a unified management effort to protect economic interests in the coast (Lopez, 2009).

According to wetland morphology modeling, a no-action scenario could result in a land loss of 2,118 to 4,677 square kilometers over the duration of the 50-year plan (Couvillion et al, 2013). Based on this model, the implementation of the plan could mitigate forty percent to seventy five percent of potential land loss; however, the plan does not do enough to prevent a net loss of coastal ecosystems in Louisiana (Couvillion et al, 2013). The coastal restoration planning tool used to choose the projects in the Coastal Master Plan, encourages a piecemeal approach to coastal restoration that looks at individual projects rather than an interconnected system as a whole (Groves and Sharon 2013). The storm surge models measured individual natural features for their value in reducing storm surge, failing to account for the negative and positive feedbacks of artificial and natural features (Cobell, et al 2013). The piecemeal nature of the Coastal Master Plan may be a symptom of fiscal constraint (Groves and Sharon 2013).

The CPRA planning tool incorporated stakeholder values influencing project selection (Peyronnin et al, 2013). The incorporation of industry priorities into the project selection process is better suited by a reductionist approach rather than looking at the system as a whole. For example, ecosystem services were measured based on recreational and economic value, influencing the types of ecosystems restored (Peyronnin et al, 2013). Weinstein acknowledges the need for an integrated theory that addresses ecological, social and economic conflicts and tradeoffs in coastal restoration; however, he explains how attempts to do this tend to favor one of the three values and fall short (2008). The establishment of paleo-ecological baselines that guide coastal restoration projects is an alternative approach (Watson et al, 2011). Furthermore, a need

exists to make scientific data accessible at the grassroots level so that communities impacted by coastal land loss can take a more active role in the coastal restoration process (Bethel et al, 2014). Similarly, Bethel et al, argue for the incorporation of geospatial and ecological data by decision-makers for coastal restoration projects (2011). Herd (2010) stresses the importance of creating a functional ecological scale for decision-making.

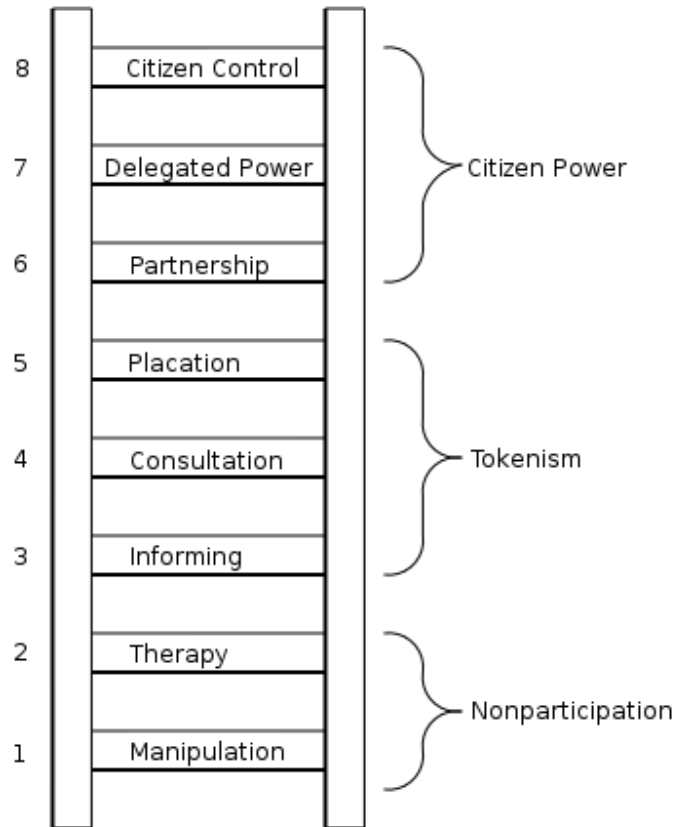
Thus far, studies of coastal restoration and the planning process of the Coastal Master Plan have used other methodologies to evaluate the plan. Lopez describes the theory behind the multiple lines of defense strategy (2009). Groves and Sharon (2013) and Peronian et al (2013) describe the predictive modeling tools used by the plan to measure risk reduction and land building for project selection. Cobell et al (2012) use predictive modeling to measure the reduction of storm surge for different restoration and protection projects. Visser et al (2013) use a vegetation model to measure the impacts of project selection on plant and community distribution. Rivera-Monroy et al (2013) use a spatial statistical approach to measure the effect of different restoration projects on coastal eutrophication in the Gulf. This study differs in its interview-based approach and in its focus on evaluating the planning process rather than the effectiveness of the plan to reduce flood risk or promote land building.

Other studies suggest alternative approaches to restoration, where this study seeks to make the role of stakeholder values more transparent. Watson et al (2011) study the use of estuarine targets, in highly altered ecosystems, based on baseline environmental conditions to drive restoration efforts. Bethel et al explore the feasibility of incorporating geospatial technology with traditional ecological knowledge into restoration planning (2011). Weinstein argues that environmental baselines have permanently shifted because of human activity, and that restoration planning should seek to balance economic growth and preservation/conservation of coastal resources (2008). These studies justify the need to understand the current project selection process to measure against alternative approaches.

Planning Theory

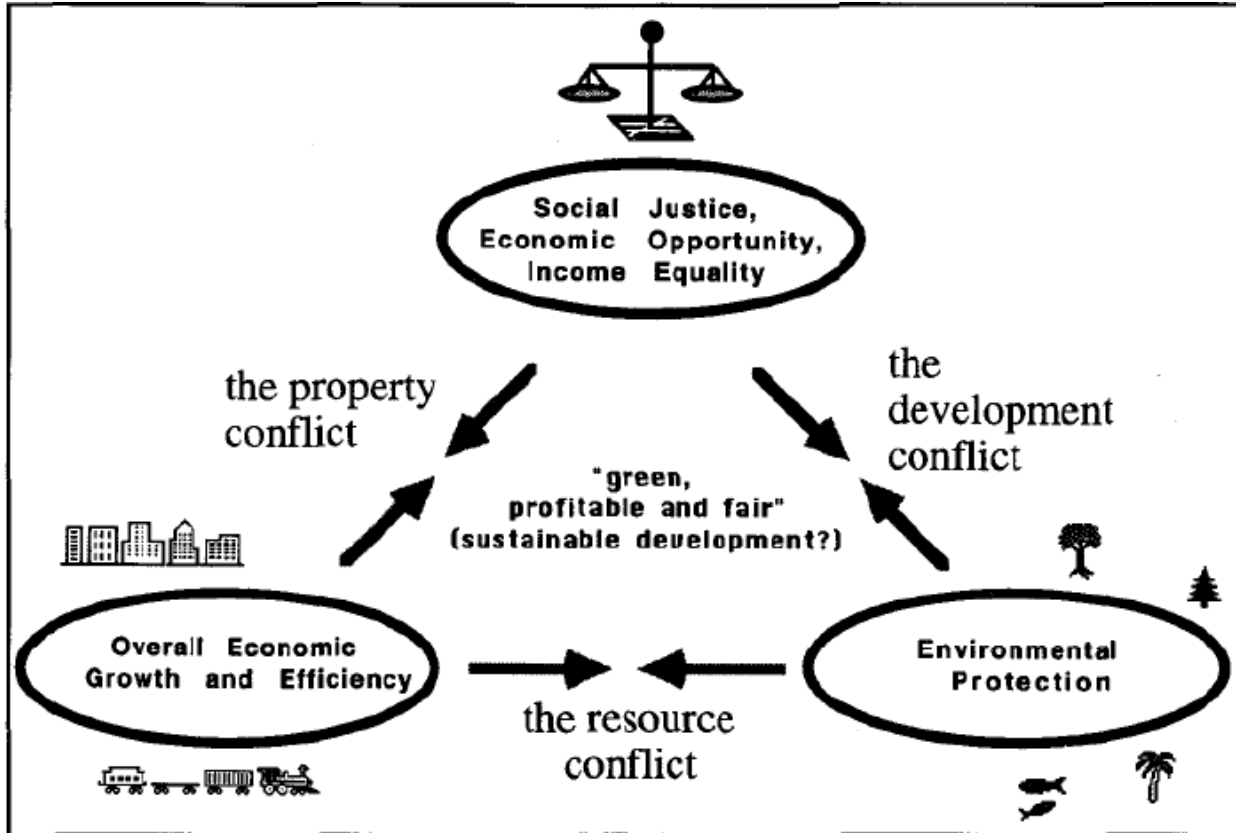
The planning process is as important as planning outcomes. Planning theory provides the tools by which to measure a plans participation process. Sherry R. Arnstein discusses the importance of public participation in the planning process. Figure 1, shows Arnstein's ladder of citizen participation. The ladder measures the level a planning participation process empowers the community (Arnstein, 1969). Planning participation is meant to redistribute power from decision makers to the community so that the outcome is representative of a compromise between all perspectives rather than just influential or powerful perspectives (Arnstein, 1969). The ladder has 8 levels of citizen participation ranging from manipulation to citizen control (Arnstein, 1969). These participation levels fall under three categories, non-participation at the bottom, tokenism in the middle, and citizen power at the top (Arnstein, 1969). As you move up the ladder the process improves and the community is more empowered to influence the outcome of a plan (Arnstein,1969).

Figure 1 Sherry R Arnstein's Ladder of Citizen Participation



Scott Campbell's discusses the challenges and the potential opportunities of incorporating environmental values into planning which has traditionally been concerned with social and economic issues (Campbell, 1996). Figure 2 shows Campbell's sustainability triangle. The triangle shows the opposing needs of the environmental, economic and social aspects of planning (Campbell, 1996). The triangle identifies three primary sources of conflict: property resources and development (Campbell, 1996). While the private sector needs government intervention to minimize nuisances and organize land uses the private sector resists, government infringement on property rights (Campbell, 1996). Additionally, businesses need government intervention to look out for the long-term sustainability of resources; business also resists regulation, affecting business activities and potential profits (Campbell, 1996). Lastly, government is tasked with promoting social equity, which can mean raising standards of living, which places increase resource demands on the environment. At the same time, government is tasked with protecting the environment for unsustainable resource use (Campbell, 1996). Campbell explains that within these three sources of conflict, common interests exist. Thus, planning must use the common ground to build coalitions for mutually beneficial action (Campbell, 1996).

Figure 2 Scott Campbell's Sustainability Triangle



John Forester explores some of the challenges of deliberation and participation in planning (1998). Forrester explains the power and limitations to a scientific approach used when planning (Forrester, 1998). He warns against technical planning approaches removed from planning theory that fail to evaluate quality and sustainability for future generations explaining that technical success alone may not create a holistic outcome (Forrester, 1998).

Forrester articulates three central points to improve the participation process for environmental planning (Forrester, 1998). The first point describes the relationship between the effectiveness of negotiation and level of participation (Forrester, 1998). With increased participation it becomes increasingly difficult to reach an effective negotiation where opposing parties mutually benefit (Forrester, 1998). This is the challenge of environmental planning in the face of modern social and economic demands on land and resources (Forrester, 1998). The second point explains how our traditions of inquiry can inform the participation and negotiation process to avoid ineffective negotiation where opposing parties mutually suffer (Forrester, 1998). The third point explains how achieving a common sense of issues alone is not enough to build consensus for joint action. Planning must go further by creating mechanisms for action and steps toward and through implementation, rather than just talk, planning and promises (Forrester, 1998).

The Coastal Master Plan attempts to resolve a history of development without concern for the ecological ramifications of coastal activity. People have become accustomed to living and

working in the coastal zone in a way that is unsustainable to the ecological services by which they depend. Past restoration efforts, were limited in their ability to address the economic externalities that drive land loss. The current plan is different in that it looks at restoration as a flood mitigation strategy and with an economic focus. The theories of Arnstein, Forrester and Campbell will inform the analysis of the plans participation process.

Chapter 3 Methodology

Research Design

This research seeks to understand how the conflicting interests of competing stakeholder groups are reconciled in the Louisiana 2012 Coastal Master Plan. This study conducted qualitative analysis of stakeholder groups that have participated in the planning process to answer the following research questions.

1. What do stakeholders see as the best strategies for reducing flood risk and reversing land loss and why?
2. Do stakeholder parties feel that the plans project selection; prioritization and overall scope adequately address their needs and concerns for the coast?
3. What are the economic and ecological benefits and tradeoffs of the plan?

The research conducted semi-structured interviews with key economic and environmental stakeholders of the coastal restoration planning process. The study chose participants from the stakeholders listed in the Coastal Master Plan and organizations active in local coastal restorations issues. Each organization participated in the Coastal Master Plan planning process, and the person interviewed was knowledgeable about the issues. The study contacted participants by telephone and email using contact information found on their websites. The study conducted interviews by telephone and recorded the information of the interviews by transcribing the responses by hand and then typing them up after the conversation.

Methods

The study conducted eleven semi-structured interviews across two stakeholder groups representing economic and environmental interests in the Louisiana coastal zone. The study used open-ended questions to prompt stakeholders into explaining their needs and concerns about the Coastal Master Plan and the planning process. Interview questions asked pertained to project types, project selection and prioritization, coastal land loss, and flood risk issues. The themes of the interviews were structured around the 3 research questions of this study. The analysis of this study compared and contrasted the responses of different stakeholders and stakeholder groups. The analysis also used planning theory to measure the level of citizen control, sustainability and effective negotiation. To measure the power dynamics of different stakeholder groups the study assumed that stakeholders with more influence would express greater satisfaction with the project selection process than other stakeholder groups. The study also assumed that the less the economic externalities of an industry were mitigated the greater their influence. The study also assumed that an absence of ecological tradeoffs related to an environmental group's mission would indicate a higher level of influence on project selection and prioritization. Thus, evenly distributed benefits and tradeoffs across individual stakeholders and stakeholder groups would mean even distribution of power and influence. Moreover, benefits and tradeoffs would reflect any imbalance in power and influence accordingly. The

study tried to capture the true nature of stakeholder views and values in the findings section; however, generalization of stakeholder responses was necessary in the analysis.

Through interviews, this study gained an understanding of the immediate concerns stakeholders had concerning coastal land loss and flood risk. This study also shed light on the varying levels of satisfaction with the current plan. Additionally, this study discovered what each stakeholder group would like to see from the plan in future updates. Lastly, this study gained an understanding of the varying preferences for project types across stakeholder groups. The interviews revealed the stakeholders who felt that the resulting plan represented their interests, as well as those stakeholders that did not.

Classifying Stakeholder Groups

This thesis classifies stakeholder groups into two categories, economic stakeholders and environmental stakeholders. The two classifications of stakeholders are representative of the competing needs and concerns within the coastal zone. The following tables show the stakeholders contacted for the study and of the organizations contacted who agreed to participate.

Figure 3 Table of Participants from the Economic Stakeholder Interview Group

Business Association	Interviewed	Contacted but not Interviewed	Position of Person Interviewed
Louisiana Oil and Gas Association (LOGA)	Yes		Coastal Zone Lawyer
The Port Association of Louisiana (PAL)	Yes		Director
The United Commercial Fishermen’s Association (UCFC)	Yes		Director
Louisiana Landowners Association (LLA)	Yes		Director
Louisiana Chemical Association (LCA)		Yes	NA

80% Participation

Figure 4 Table of Participants from the Environmental Stakeholder Interview Group

Environmental Non Profit	Interviewed	Contacted but not Interviewed	Position of Person Interviewed
The Coalition to Restore Coastal Louisiana (CRCL)		Yes	NA
The Gulf Restoration Network (GRN)	Yes		Coastal Wetlands Specialist
The Louisiana Wildlife Federation (LWF)	Yes		Director
The Nature Conservancy (TNC)	Yes		Director of Freshwater Marine Sciences
The Louisiana Audubon Society (LAS)	Yes		Director
Environmental Defense Fund (EDF)	Yes		Director of Science Policy, Mississippi River Delta Restoration
Lake Pontchartrain Basin Foundation (LPBF)		Yes	NA

71% Participation

The economic stakeholders chosen represent the major industry interests within the Louisiana coastal zone. The industries represented in the Coastal Master Plan are oil and gas, petro chemical, navigation, and fishing. Each industry has an association that advocates for the needs and concerns of their members. These industry associations participated in the Coastal Master Plans industry focus groups that informed project selection. Business associations represented a broad industry perspective of both large and small businesses, for this reason the study chose to talk to business associations rather than individual businesses. The study contacted these groups by phone and email on multiple occasions. Of the five associations contacted, four participated in the study. The organizations that agreed to participate were the Louisiana Oil and Gas Association, The Port Association of Louisiana, The United Commercial Fishermen’s Association, and the Louisiana Landowners Association. The Louisiana Chemical Association was not available for an interview during the time constraints of the interview process.

The environmental stakeholders chosen are active in coastal restoration efforts in Louisiana and can offer an expert opinion on the ecological tradeoffs and effectiveness of the plan. The environmental groups that are active in coastal restoration are the Lake Pontchartrain Basin Foundation, The Coalition to Restore Coastal Louisiana, The Gulf Restoration Network, The National Wildlife Federation and the Louisiana Wildlife Federation, The Nature Conservancy, The Audubon Society, and the Environmental Defense Fund. The study contacted each of these groups by phone and email on multiple occasions. The organizations that agreed to participate were The Gulf Restoration Network, The Louisiana Wildlife Federation, The Nature Conservancy, The Audubon Society, and the Environmental Defense Fund.

Merit of Qualitative Analysis

The study designed the research of this study to be consistent with the National Institute of Health’s guidelines for protecting human research participants. The study based stakeholder

recruitment on the two classifications that would be included in the study. Four of the five economic stakeholders contacted agreed to participate. Five out of seven of the environmental groups contacted agreed to participate. This introduced bias of who was included in this study. The primary limitation of this study was its time constraints. The phone interviews could not exceed forty-five minutes and the study conducted no follow up interviews. The study kept sample size small by targeting business associations and environmental organizations that could speak to the varying needs and concerns of each group's diverse constituents. The combination of a small sample set, and semi-structured interviews allowed this study to detail how coastal land loss and increased flood risk affects stakeholder groups, as well as how they are adapting to the continued escalation of these two coastal issues.

The choice to talk to large business associations and large environmental groups influenced the studies findings. by focusing on the the views and values of the big players the study is able to look at the effectiveness of the plan's focus groups and framework development teams. However, this focus does not capture the perspectives of local small scale community based groups that may have participated in the community outreach part of the planning process. The difference of scale is important because large scale organizations are removed from the immediate needs, and necessary compromises that would influence the responses of local actors. Additionally this study talked to people in positions of power with prominent roles in the planning process who may have felt more compelled to be in agreement with the rhetoric and the outcomes of the plan.

This research contributes to the literature on the Coastal Master Plan, climate adaptation planning, and bipartisan planning approaches to ecological restoration efforts. The specific benefits and tradeoffs of project selection and prioritization for individual stakeholder parties within the Louisiana coastal zone lack transparency. This paper seeks to shed light on the needs and concerns of different stakeholders, and the benefits and tradeoffs of restoration from a working coast perspective across economic and environmental interests to reveal how well the plan has reconciled conflicting demands on coastal resources.

Chapter 4 Economic Stakeholder Findings

The Coastal Master Plan seeks to restore a working coast. A restoration effort that seeks to restore a working coast is different from a restoration effort whose primary goal is to restore ecology. Restoration from a working coast approach emphasizes the natural processes, habitats and natural features that serve the needs and concerns of major industries within the coastal zone, and will de-emphasize those natural processes that are in conflict with the needs and concerns of industry in the coast. This section discusses the stakeholder findings for each business association of the major industries of the coastal zone. For each industry interviewed, relative background information about membership, stated mission, and relevant activity in the coast is given. This chapter organizes the key perspectives for each industry into three major themes associated with the three research questions of this study.

Louisiana Oil and Gas Association

The Louisiana Oil and Gas Association or LOGA represents both the independent and service sectors of the Louisiana oil and gas industry. This includes exploration, production and oilfield services. LOGA represents 1,600 companies in Louisiana, many of which have interests in the coastal zone (Louisiana Oil Gas Association, 2015). LOGA's stated goal is to create incentives for Louisiana's oil and gas industry by discouraging tax increases, changing existing regulations, and promoting the importance of the Louisiana oil and gas industry to the public and the government (Louisiana Oil Gas Association, 2015). According to the Coalition to Restore Coastal Louisiana's website, a quarter of the oil and gas used by Americans travels through Louisiana wetlands (Coalition to Restore Coastal Louisiana). Additionally, 80 percent of offshore oil and gas in the US will also, travel through wetland habitat in Louisiana (Coalition to Restore Coastal Louisiana). Thus, the erosion of these habitats and natural features exposes oil and gas infrastructure to open water, making this infrastructure progressively more susceptible to storm damage (Coalition to Restore Coastal Louisiana).

Louisiana law requires that oil and gas companies restore any damages to wetland habitats incurred by their activities. According to the LOGA's website, Plaquemines and Jefferson Parish filed several lawsuits in the coastal zone (Louisiana Oil and Gas Association, 2015). These lawsuits claim that the Louisiana oil and gas companies in question did not restore the wetland habitats impacted by their activities. Figure 5 shows the locations of these lawsuits.

Figure 5 Table of Places Where Lawsuits have been filed Against Oil and Gas Industry

Environmental Law Suits Filed Against Oil and Gas Companies in Jefferson Parish		
Baratari	Bayou de Fleur	Little Lake
Bay de Chene	Bayou Perot	Manila Village
Environmental Law Suits Filed Against Oil and Gas Companies in Plaquemines Parish		
Alliance	Blind Bay	Lake Hermitage
Balize Bayou	Bohemia	Linder Oil
Bastian Bay	Burwood	Potash
Bay Batiste	Coquille Bay	South Pass Block 24
Bay Denesse	Cox Bay	Tiger Pass
Bayou Gentilly	Dalcour	West Bay
Black Bay	Helis Oil	West Delta Block 52

(Louisiana Oil and Gas Association, 2015).

The Southeast Louisiana Levee Authority has also sued the industry with similar claims.

Key Perspectives

Preferred Strategies for Reducing Flood Risk and Reversing Land Loss

According to LOGA, the best strategy to reduce flood risk and land loss is to consult with industry representatives during project selection to find the project type that has the least impact on oil and gas infrastructure. LOGA stated no preference towards any project types. However, LOGA explained that they are confident in the representation of its interests in project selection. LOGA’s confidence in their representation reflects the power that the industry has to influence project selection. LOGA views the oil and gas industries role in restoration as voluntary and at the industries discretion. LOGA explained that they often do build levees and plant trees in the community. Additionally, LOGA views the working coast approach to restoration as one that does not increase the industries financial or legal accountability for the industries past, present, and future destruction of wetland habitat. LOGA advocates for the reduction of environmental regulations in the coastal zone, and claims that current regulations within the coastal zone are excessive. Furthermore, LOGA claims that increased restrictions on industry activities in the coast would not prevent further land loss. The oil and gas industry supports the idea that industry will help pay for coastal restoration, but does not feel that a legal settlement for the land debt the industry owes the state is a reasonable way to fund the plan. LOGA claims that any money won in a legal settlement for the violation of the coastal management act would go to the litigators and not the plan.

How Well the Plan Meets Stakeholder Needs

The Coastal Master Plan strongly represents the needs and concerns of the oil and gas industry; however, LOGA acknowledges that the plan does not do enough to reverse the land loss trend. LOGA claims that the plan's strength is its ability to prioritize limited funding. This response shows that the oil and gas industry is satisfied with the current prioritization of funding for projects in the plan. LOGA claims the plan's weakness is its limited ability to restore the sediment load from the river. This response shows that LOGA recognizes that the plan does not do enough to restore the natural sediment load to the landscape. The oil and gas industry can afford to value the preservation of its business practices over restoration because the projects in the plan protect the industry's critical assets. LOGA claims that the oil and gas industry will always do more to protect their assets such as moving locations or building levees. This response shows that the oil and gas industry is not entirely reliant on the Coastal Master Plan for protection from storm surge and flooding.

Ecological Tradeoffs

An ecological tradeoff of promoting the production of fossil fuels within the coastal zone as part of a restoration strategy is that the plan is less likely to address CO₂ emissions and the role of the industry as a driver of sea level rise and climate change. Currently the plan does not mention the role of regulating carbon to reduce future sea level rise. LOGA does not anticipate the reduction of fossil fuel production over the next 50 years and expects to have a continued influence on decision making in Louisiana. When asked what the industry anticipates for the next 10 to 50 years for the Louisiana coastal zone, LOGA explained that the industry as a whole is not going anywhere on a national scale and Louisiana and the Gulf will remain important to oil and gas exploration. Furthermore, LOGA stated that the oil and gas industry will remain a major employer, and economic driver embedded in Louisiana culture that will guide the decisions made in the coast over the next 50 years. The power and influence that the oil and gas industry exhibits in the planning process makes it unlikely that the plan will address the critical role CO₂ emissions play in sea level rise.

Another ecological tradeoff of the influence of the oil and gas industry in the planning process is that the plan is less likely to hold the oil and gas industry accountable for existing damages to wetland habitat. Currently the plan does not address existing damage from the oil and gas industry. When asked about the industry's views on recent coastal lawsuits LOGA argued that they do not view these lawsuits as having any merit to efforts to restore the coast. Furthermore, LOGA claims that the lawsuits will not help to pay for the Coastal Master Plan. LOGA also claims that any money won will only go to litigators. This response shows the oil and gas industries' agenda to avoid legal and financial accountability for existing damage to wetland habitats caused by the industry's activities within the coastal zone. The oil and gas industry has shown a continued disregard for coastal regulations and the state's failure to enforce existing environmental laws is a potential barrier to restoration from a working coast perspective.

Port Association of Louisiana

The Port Association of Louisiana or PAL has 32 voluntary member ports and affiliated organizations, and promotes the development of port infrastructure and navigation (Port Association of Louisiana). Louisiana has an expansive waterway system and an abundance of ports and port related infrastructure such as state owned cargo transfer facilities, and equipment for many water related industries (Port Association of Louisiana). Five of the six deep-water ports are located in the Louisiana coastal zone (Coalition to Restore Coastal Louisiana). These ports handle more than 450 million tons of cargo annually, 20 percent of the nation's waterborne commerce (Coalition to Restore Coastal Louisiana). Continued land loss risks the exposure of deep-water ports to open water (Coalition to Restore Coastal Louisiana). As wetlands, decline port infrastructure becomes more and more vulnerable to storm damage. Wetland shorelines and barrier islands protect navigation channels, anchorages and ports from storm surge (Coalition to Restore Coastal Louisiana). Extreme losses of coastal wetlands will expose waterways to open water, increasing harbor and maintenance costs.

According to the Louisiana Wildlife Federations website, the Army Corps of Engineers dredges approximately 60 million cubic yards of sediment from Louisiana ports and shipping channels annually, 20 percent of the sediment is used for land building efforts (National Wildlife Federation, 2015). According to PAL several examples exist where dredged sediment is contributing to land building efforts. Port Fourchon is an example of a large coastal port that uses the dredged material of channels to create marsh to serve as barriers to flooding. Dredged sediment also created the entrance marsh along Morgan City. The river maintenance for the Calcasieu River channel is utilizing dredged material to prevent salt-water intrusion. The deepening of the channel to Port Iberia will utilize the dredged material for restoration. Additionally, an economic study funded by the Water Resources Development Act, (WRDA), will evaluate the feasibility of using the sediment from the deepening of the Mississippi River for land building efforts.

Key Perspectives

Preferred Strategies for Reducing Flood Risk and Reversing Land Loss

According to PAL the best strategy for reducing flood risk and reversing land loss are projects designed to accommodate longstanding maritime practices. PAL claims that river diversions can affect anchorages, which are important for vessels getting to dock, and are important to the loading and unloading of goods. PAL is willing to support restoration projects that do not affect maritime practices. PAL views the working coast approach to restoration as one that informs the engineering and design of restoration projects and provides sediment for potential restoration projects, but without the financial responsibility of the sediments transport. PAL supports the use of dredged sediment for land building efforts; however, “only when this practice is financially appropriate”. PAL explains that this expense “should be accounted for in the Army Corps of Engineer’s use of the funds generated by the harbor maintenance tax”, but without raising that tax. Currently the Army Corps of Engineers dumps dredged sediment in the gulf when there is not enough money to pay for its transportation. CPRA does not address this practice in the plan. PAL claims that it is important to protect industry interests because it is

industry that will ultimately pay for restoration. PAL also claims that navigation is “married to coastal issues” and that it is necessary to find a compromise between ecological and maritime needs. PAL’s rhetoric is inconsistent with its actions. The navigation industry is primarily responsible for the channelization of the river and the disruption of ecological processes that are a major cause of land loss. While the industry is willing in theory it is not willing in practice to sacrifice some maritime practices or accept some financial burden to account for the ecological externalities of its activities.

How Well the Plan Meets Stakeholder Needs

The Coastal Master Plan strongly represents the needs and concerns of the navigation industry. The plan offers increased protection for critical navigational infrastructure. While there have been some project impacts to maritime practices these impacts are unanticipated and the plan goes to great lengths to protect the interests of navigation in the plans project selection and prioritization of funding. PAL is confident in the plans ability to preserve maritime interests and in the industry’s ability to take additional measures to accommodate sea level rise and increased risk from storms. PAL explains that ports will accommodate sea level rise where they can by building levees, floodgates and hardening infrastructure to deal with flooding. This response shows the confidence of the industry in the current plan, and the industry’s ability to protect their interests even with further land loss and increased flood risk. However, PAL acknowledges that presently CPRA does not do enough to mimic what the Mississippi river does naturally. This statement shows that the industry recognizes that the only way of stabilizing the coast is to restore the ecological processes of the river, and to utilize all sediment resources for land building efforts. Furthermore, the plan does not address the financial barrier for transporting dredged sediment to the coastal zone, nor does it address the financially responsible party.

Ecological Tradeoffs

The primary ecological tradeoff of incorporating maritime interests into project selection and prioritization is the limitations this creates in restoring ecological processes to reconnect wetland habitats to freshwater and sediment loads from the river. If the navigation industry truly supports the idea that industry should pay for restoration, then they will take on this financial burden or work to solve the financial barrier to transporting dredged sediment for land building projects. A sustainable partnership with the navigation industry would restore the rivers fresh water and sediment resources to all wetland habitats cut off from the river. These necessary actions are unlikely in the near term without further leadership from the Army Corps of Engineers, the Federal or the State government.

United Commercial Fishermen’s Association

The United Commercial Fishermen’s Association or UCFA is the oldest trade association for commercial fishermen in Louisiana representing commercial shrimpers, oyster farmers, crabbers, fin fishermen, dock owners, processors, restaurateurs, business owners and individuals concerned with preserving the culture and economic vitality of the industry (United Commercial Fishermen's Association, 2015). UCFA is trying to save the industry and prevent the economic decline of activity surrounding the fishing industry in coastal Louisiana. The members of this

association have an intimate relationship with the coast. Working and living in the coastal zone, their livelihood and way of life depend on the health and sustainability of coastal habitats and the success of the Coastal Master Plan.

Key Perspectives

Preferred Strategies for Reducing Flood Risk and Reversing Land Loss

According to the UCFA the best strategies for reducing flood risk and reversing land loss are projects that restore ecological functions. Particularly, projects that restore the rivers sediment load to the landscape, such as projects that utilize dredged sediment from harbor maintenance. Restoring the Mississippi sediment load to cut off wetland habitats is a major priority for the fishing industry. The UCFA views the working coast approach to restoration as one that protects smaller business that cannot afford to protect themselves. UCFA explains that the territories of different commercial resources are getting smaller and smaller. Livelihoods are lost as further land is lost. Storms destroy housing where people who work in the industry live. Storms also destroy the habitats within commercial fishing territories. There is less and less land for people to live off. Additionally, many fishermen are still dealing with the impacts of the BP oil spill. Because of land loss and the oil spill many fishermen cannot get good enough prices to stay competitive or make a living. The fishing industry is dependent on the plans ability to prevent habitat loss and reduce flood risk.

How Well the Plan Meets Stakeholder Needs

The UCFA does not feel that the plans project selection and prioritization is representative of the needs and concerns expressed by the fishing industry during the planning process. The UFCA explains while their seal appears on the plan as a supporter, many fishermen do not feel that the plan represents their input and ultimately does not do enough to address the needs of the industry. According to the UCFA, the fishing community feels apathetic and discouraged about the planning process and restoration efforts. This response shows that while the industry has participated in planning efforts, the plan does not do enough to address their immediate needs. The UCFA expects continued decline of habitat and fisheries, further land loss and increasing risk from flooding and storms. The UCFA would like to see a significant investment to build up coastal lands with dredged sediments from harbor maintenance. The UCFA would also like to see money spent on actions taken to rebuild the coast, rather than more money spent on further studies. The current extent and fiscal constraints of the plan accept further land loss, which will directly affect small businesses within the fishing industry that are completely dependent on the plan to protect their interests in the coastal zone.

Ecological Tradeoffs

An ecological tradeoff of restoration from a working coast perspective is the emphasis of economically significant species and habitats in restoration efforts, and the lack of monitoring of species with no economic significance. A potential ecological tradeoff is the temptation to continue to support the exploitation of declining species in declining habitats, putting additional stresses on these species and those associated with their food chain. However, the activities of

| the fishing industry are far less invasive than the activities of other coastal industries, and show the most potential for sustainable partnership.

Louisiana Land Owners Association

The Louisiana Landowners Association or LLA represents large and small landowners such as farmers, developers, timber producers, resource managers, bankers, ranchers and oil and gas producers (Louisiana Land Owners Association). According to their website the “LLA provides increased political leverage and access by mobilizing the resources of big and small landowners who share an interest in protecting the rights of individuals to own, manage, develop, use and dispose of land without undue interference from government”, (Louisiana Land Owners Association). LLA helps landowners with “public access, liability, wetland management, taxes, mineral leasing, timber valuation, scenic rivers, Atchafalaya Basin, expropriation, levee servitudes, and solid and hazardous wastes” (Louisiana Land Owners Association). LLA represents major private landowners in each of the coastal zone regions. In the coastal zone, much of the land not held publicly the LLA represents. The majority of LLA members lease their land for various activities such as recreational and commercial hunting and fishing, camping, oil, gas and mineral rights.

Key Perspectives

Preferred Strategies for Reducing Flood Risk and Reversing Land Loss

According to the LLA, the best strategies for reducing flood risk and reversing land loss are projects that restore ecological functions such as hydrologic restoration and sediment diversion, as well as first line of defense projects such as barrier islands and shore line protection. The LLA feels that these projects offer the most “bang for your buck” because they “promote long-term sustainability”. The LLA is also a proponent of expanding the levee system to preserve existing land uses and ways of life. The LLA views levees as a better option than moving and believes that it is important to protect property, people’s livelihoods and culture. LLA explains that they think that more money should be invested to ensure the future viability of the coastal zone region. The LLA also feels that the plan’s promotion of nonstructural protection is driving people away from the coast. The LLA feels that landowners should have a larger influence on project selection. The LLA explains that their primary concern with the project selection process is that it is heavily reliant on computer models and not on the experience of landowners who have experience in preventing land loss. This response shows that private landowners’ feel that their experience should be valued more than computer modeling.

How Well the Plan Meets Stakeholder Needs

The LLA represent a diverse range of land uses; thus will have mixed views on how the plan meets landowner’s needs. The LLA explains that large corporations are implementing their own protection to maintain their lands getting permits from the Army Corps of Engineers to stabilize their own shorelines in places like Terrebonne parish. However, smaller landowners are dependent on the plans ability to protect them from losing their lands. Furthermore, different projects will affect different land uses differently depending on their land use and location.

Because larger landowners and many members are not in densely populated areas they are not protected from 100-year storms or levees. Most members that are outside the protection of the levee system are experiencing pressure to relocate as well as the economic implications of the loss of confidence in the region associated with increased flood and storm risk. Families are at a greater risk outside of the levee protection system. Future land loss will mean that many members will lose their land, livelihoods, cultural heritage and way of life. Changes in water regimes from projects or from lack of intervention will affect how members can use their land and disrupt current business activities. When asked what private landowners expect to see over the next 10 to 50 years, the LLA replied that they would like to see some ability to turn around the land loss trend but did not expect to see this in the next 10 years. This response shows the level of confidence private land owners have in the plan.

Ecological Tradeoffs

An ecological tradeoff of this partnership is the risk of levee building projects that seek to preserve existing water regimes to protect economic interests. This action will disrupt natural ecological processes and will have secondary impacts on surrounding habitats. Furthermore, this action will not allow ecosystems to shift inland with rising sea levels, threatening their ability to adapt to climate change as well as their long-term sustainability. Another potential tradeoff of this partnership is the implementation of risk reduction levees outside of the coastal zone, which would further cut off wetland habitat and disrupt hydrologic processes. Lastly a potential tradeoff of this partnership is the political influence of large landowners on project selection should the LLA succeed in de-emphasizing the role of environmental modeling for project selection and prioritization. Computer modeling exists to make project selection strategic

Economic Stakeholders Analysis and Major Themes

Economic stakeholders have diverging project preferences. However, economic stakeholders have similar views towards regulation. Economic stakeholders differ in their level of satisfaction with the plan, which corresponds with their project preferences. Associations most advocating for ecological restorations (UCFA, LLA) are the least satisfied with the plan because of the limited degree to which the plan has been able to implement these types of projects. The industries with the highest levels of satisfaction with the plan are also the industries associated with the greatest ecological tradeoffs (LOGA, PAL). This is because the plan has failed to mitigate the externalities of these industries. These trends reflect an imbalance of power among economic stakeholders. Industry associations with memberships of mostly small businesses have the least confidence in the plan meeting their needs (UCFA, LLA). Industry associations with memberships of mostly large businesses have the most confidence in their ability to influence project selection (LOGA, PAL).

Preferred Strategies for Reducing Flood Risk and Reversing Land Loss

Figure 6 compares stakeholder preferences across different project types. The projects that best serve one industry will often negatively affect another industry. For example, private landowners advocate for the expansion of the use of levees to preserve historic water regimes and for risk reduction. These types of projects negatively affect habitat and ecological processes,

which will affect other resource users. An alternative to the use of levees for risk reduction are nonstructural protections however private land owners feel that this approach pressures people to relocate and discourages economic confidence in high risk areas. The fishing industry and private landowners advocate for the restoration of ecological processes; however, these project types can affect maritime processes. All parties support the use of dredged sediments for land building efforts; however, the navigation industry does not want the added financial burden of transporting the sediment. LOGA declined to state a preference for any project type explaining that they support all projects that restore the coast as long as their infrastructure is not negatively affected. LOGA was confident in the representation of their interests in project selection. Similarly PAL supported all project types that didn't impact maritime practices however the one project type the most mitigates the impact of the industries presence in the coastal zone, river diversions, is the one project type that most conflicts with industry interests. The UCFA felt that so much more could be done for land building efforts with the sediment being dumped in the gulf. While the LLA felt that the best use of limited restoration fund was the restoration of ecological processes.

Figure 6 Table of Economic Stakeholders Responses on Project Types

Project Selection						
Economic Stakeholder Groups	Levees	Restoration of Ecological Processes	Land Building From Dredged Sediment	First Line of Defense	Marsh Creation	Non Structural Protections
Louisiana Oil and Gas Association (LOGA)	No conflict	Support (if oil and gas infrastructure is unaffected)	Support (if oil and gas infrastructure is unaffected)	Support (if oil and gas infrastructure is unaffected)	Support (if oil and gas infrastructure is unaffected)	No comment
The Port Association of Louisiana (PAL)	No conflict	Affects some maritime activities	Support if not held financially liable	Support	Supports if doesn't impact channels	No comment
The United Commercial Fishermen's Association (UCFC)	Causes habitat destruction	Strongly support	Strongly support	Support	Supports	No comment
Louisiana Landowners Association (LLA)	Strongly support	Strongly support	Support	Strongly support	Feels too much emphasis is given to marsh creation	Does not support

One of the effects of stakeholder involvement in the Coastal Master Plan is an overall agreement with the rhetoric of the plan's restoration theories such as the working coast approach without changes in industry values, commitments or actions. The working coast approach seeks to find the restoration strategy that has the least amount of impact on the economic activity of an area that is experiencing increased flood risk or land loss while maximizing risk reduction and land building potential in project selection. This approach justifies the economic emphasis for restoration by claiming that industry will pay for restoration efforts. Furthermore, the sustainability of this approach requires that industry activities not negatively affect restored areas. Figure 7 shows how industry goals conflict with the goals of the working coast approach. The most apparent contradiction between the stated goals of economic stakeholders and the working coast approach is the belief that environmental regulations are not necessary to protect wetland habitat. Furthermore, while economic stakeholders agree that industry should pay for

restoration, this funding mechanism does not yet exist in the plan. The industries that are most responsible for land loss, oil and gas and navigation, receive the most amount of protection but are actively avoiding financial accountability for the economic externalities of their industry. The oil and gas industry is not willing to pay for the land debt they owe to the state and the navigation industry is not willing to increase the harbor tax to pay for the transportation of dredged sediments. Industries that are tied to the landscape and are made up of small business owners offer the most potential for sustainable partnership; however, these businesses receive the least amount of protection from the plan. The future viability of commercial fishing and wildlife resource users is threatened by the plans limited ability to curb land loss in the near term, these small businesses are unlikely to agree to additional financial hardship to pay for the plan.

Figure 7 Table of Economic Stakeholders Views on the Working Coast Approach

Working Coast Approach				
Economic Stakeholder Groups	Supports Theory	Supports Increased Environmental Protections	Agrees that Industry Should Pay for Restoration	Is Funding the Plan
Louisiana Oil and Gas Association (LOGA)	Yes	No	Yes	No
The Port Association of Louisiana (PAL)	Yes	No	Yes	No
The United Commercial Fishermen’s Association (UCFC)	Yes	No	Yes	No
Louisiana Landowners Association (LLA)	Yes	No	Yes	No

How Well the Plan Meets Stakeholder Needs

Figure 8 compares level of satisfaction with the plan across economic stakeholders. The table shows that level of satisfaction does not correspond with the confidence in the plans ability to reverse the land loss trend. The table also shows that industry associations with low levels of satisfaction with the plan are also dependent on the plan and industry associations with high levels of satisfaction are not dependent on the plan. There is a discrepancy in protection and satisfaction between industries such as oil and gas, and navigation characterized by large corporations and industries characterized by small businesses such as the fishing industry. The industries that receive the most protection are also the industries that can afford to invest in additional protection. While small businesses are completely dependent on the plan. The primary concern for wildlife resource users and small private landowners is the prevention of land loss. In the plan’s efforts to protect corporate interests, it fails to mitigate the economic externalities of industry activity in the coastal zone. Wild life resource users are least supported by the plan.

Figure 8 Table of Economic Stakeholders Level of Satisfaction with the Plan

Satisfaction With the Plan			
Economic Stakeholder Groups	Level of Satisfaction	Dependent on the Plan for Protection	Expect Continued Land Loss
Louisiana Oil and Gas Association (LOGA)	High	Not Entirely	Yes
The Port Association of Louisiana (PAL)	Moderately High	Not Entirely	Yes
The United Commercial Fishermen’s Association (UCFC)	Low	Yes	Yes
Louisiana Landowners Association (LLA)	Mixed	Mixed	Yes

Ecological Tradeoffs

Figure 9 illustrates how the ecological tradeoffs of the plan result from the plan's failure to mitigate the economic externalities of industry activities. The plan does not mitigate the economic externalities of the oil and gas industry or navigation. The plan fails to explicitly address the role of carbon emissions on sea level rise and land loss. The plan also fails to state plainly that the best-case scenarios for sea level rise assume the existence of carbon regulation and divestment from the fossil fuel industry. Furthermore, the plan's worst-case scenario for sea level rise is less than the scientific literature projects. The plan also fails to repair oil and gas canals or address the responsible party for this repair. Oil spills continue to be a threat to the region and are not addressed in the plan. The plan allows for the continued practice of dumping dredged sediment into the gulf and does not allocate funds or determine a funding source for the transportation of sediment for land building projects. Meanwhile, the habitats that remain cut off from the river will be lost if not maintained by the plan. Furthermore, as habitats continue to shrink increased pressure will be put on wildlife resources, which will lead to resource conflicts between commercial and recreational users. Furthermore, by only monitoring commercially significant species rather than functional groups of species, less protection is given to species with less human utility. The plan has succeeded in limiting the expansion of the levees beyond densely populated areas and does not use levees or dams to preserve water regimes. The plan does not address the fact that rising sea levels will cause water regimes and their corresponding habitats to shift inland, which will affect traditional land uses. Lastly, the plan will need to identify further risk reduction alternatives to the expansion of the levee system.

Figure 9 Table of Economic Stakeholders Ecological Tradeoffs

Ecological Tradeoffs			
Economic Stakeholder Groups	Economic Externality	Environmental Consequence	Mitigation
Louisiana Oil and Gas Association (LOGA)	Un repaired oil and gas canals	Saltwater intrusion accelerated land loss habitat destruction	Plan does not repair canals or require oil industry to repair canals
Louisiana Oil and Gas Association (LOGA)	CO2 emissions	Sea level rise intensifed storms	Plan does not adress carbon regulation
The Port Association of Louisiana (PAL)	Channelization of the river	Cuts of land from water and sediment load	Pland restores some ecological functions but does not address the practice of dumping dredged sediment into the gulf
The United Commercial Fishermen's Association	Incresed pressure on already tenuois habitat	Collaps of fisheries	Plan monitors economically significant species only does not monitor the impact of the industry on the entire ecosystem
Louisiana Landowners Association (LLA)	Damns and levees to preserve historic water ragimes	Unsustainable practice that does not allow habitats to shift inland with rising sea levels	Plan does not promote these kinds of projects
Louisiana Landowners Association (LLA)	Expansion of levee system for risk reduction	Further disrupts ecological processes making it harder for habitat to adapt to rising sea levels and climate change	This strategy is counter to the multiple lines of defense theory

Planning Theory

Based on Arnstein’s theory on participation, the participation process of the 2012 plan for economic stakeholders falls under the tokenism category. The plans uneven distribution of benefits and tradeoffs reflects the uneven distribution of power and influence across economic stakeholder groups. Arnstein’s article argues that the purpose of a participation process is to redistribute power and influence to incorporate the needs and values of underrepresented, less influential players into the plans outcome. A planning participation process that reflected the values of citizen control would be more redistributive.

The three primary conflicts of interest discussed in Campbell’s sustainability theory are reflected in the responses of economic stakeholders. Campbell’s resource conflict is represented in economic stakeholders need for the CPRA to intervene on the land loss ad flood risk crisis while simultaneously being opposed to regulation. The property conflict is apparent in the the LLA’s conflicting need for sustainability with their need to preserve historic land uses when historic land uses become unsustainable as water dynamics change ad habitats shift inland. The development conflict is expressed by the need to protect the livelihoods of local small businesses while also needing to limit the over exploitation of wildlife resources. The development conflict is also expressed by the need to lessen the impacts of sea level rise by

divesting from fossil fuels when it is a major employer of the state. The development conflict is also expressed by the need to protect the environment from expansion of the levee system, which while also protecting the way of life of vulnerable communities outside the levee system.

John Forester argues that a planning process should strive for significant participation with effective negotiation resulting in a win-win scenario rather than a lose-lose scenario. The plan has succeeded in achieving a significant participation from economic stakeholders. The plan has not succeeded in achieving an effective negotiation since it has failed to reverse the land loss trend which is a lose-lose scenario for all parties involved. The plan has succeeded creating common ground on the issues and agreement on the theories for action. However, the plan has failed to garner joint action since the plan lacks mechanisms for funding, regulation or next steps for stakeholders after the initial participation process.

Chapter 5 Environmental Stakeholder Findings

The Coastal Master Plan's primary goal is to reduce flood risk and curb land loss to preserve coastal economies. Many of the strategies recommended seek to restore habitat and natural features; however, the plan is not motivated from a conservation perspective. This plan is unlike traditional approaches to restore critical habitat because it is a bipartisan compromise that emphasizes resources with economic value and habitats that reduce flood risk. This plan's primary purpose is not to promote biodiversity, but to restore a coastal environment that serves human needs. This section discusses the stakeholder findings for each environmental group, giving relative background information about membership, stated mission and activity in the coast. This chapter organizes the key perspectives into three major themes associated with the three research questions of this study.

Wildlife Federation

The National Wildlife Federation or NWF works to protect wildlife and habitat for hunters, anglers, boaters, birders, wildlife watchers, outdoor enthusiasts, climbers, hikers, cyclists, campers, gardeners, farmers, and forest stewards (National Wildlife Federation, 2015). The NWF approach is to improve federal and state policies in ways that will improve wildlife conservation on public, tribal and private lands, encouraging congress to pass legislation with sufficient funding for natural resources and advocate for the inclusion of climate science in federal wildlife conservation management plans (National Wildlife Federation, 2015). The National Wildlife Federation has 9,600 members (National Wildlife Federation, 2015).

The NWF works for the conservation on private land promoting healthy fish and wildlife populations and habitat connectivity across different landholders (National Wildlife Federation, 2015). The NWF website promotes the idea that "our nation's healthy lakes, rivers, streams, wetlands, marine and coastal waters, forests, and other wild lands are vital to our public health, economy, wildlife, and quality of life" (National Wildlife Federation, 2015). The NWF argues for the importance of our country to address climate change, and work towards clean energy use. Furthermore, the NWF feels that it is the nation's responsibility to make wildlife habitat and communities more resilient to climate change (National Wildlife Federation, 2015).

The Louisiana Wildlife Federation, or LWF, is an affiliated organization of the NWF but it is its own entity. Its focus is on the enjoyment of natural resources. While the LWF has a specific work focus on Louisiana wildlife, the national organization has a larger perspective. The two entities have worked together on the gulf oil spill; however, the NWF has a gulf wide program. The LWF's primary approach is through outreach education and engagement with sportsmen to raise awareness on coastal issues.

LWF advocates for the use of the Mississippi River to rebuild the coastline (Louisiana Wildlife Federation, 2015). The chapter helped to create the Louisiana Wildlife and Fisheries Commission (Louisiana Wildlife Federation, 2015). They are currently advocating for the opening of Elmer's Island (National Wildlife Federation, 2015). The chapter also serves as an advocate on the State Water Policy Advisory Task Force for fish, wildlife and outdoor recreation, which seeks to guide the development of water management policy and planning in the state (Louisiana Wildlife Federation, 2015). The LWF is involved with the state's Atchafalaya Basin Program and the Artificial Reef Development Fund (Louisiana Wildlife Federation, 2015). The LWF has helped to convince other national conservation/environmental organizations to view the loss of the Mississippi River Coastal Delta as an environmental issue of national significance (Louisiana Wildlife Federation, 2015). The LWF participates in several resources conservation and environmental quality panels, committees and task forces such as the Pesticide Advisory Commission, the Atchafalaya Trace Commission, the Ground Water Advisory Task Force, the Management Conference of the Barataria-Terrebonne National Estuary Program, the Louisiana Oilfield Site Restoration Commission, and Louisiana Invasive Species Task Force, (Louisiana Wildlife Federation, 2015).

Key Perspectives

Preferred Strategies for Reducing Flood Risk and Reversing Land Loss

According to the LWF, the best strategies for reducing flood risk and reversing land loss are projects that promote habitat sustainability. LWF explains that marsh creation is quick and projects that build marsh and barrier islands by pumping dredged sediments and planting native vegetation are very important for wildlife habitat. LWF would also like to see more oyster reefs created and the maintenance of barrier islands, which help to protect marsh from storms. Additionally, the LWF would like to see more sediment diversion, which can help to curb saltwater intrusion, a major concern for members.

Every project has a footprint that will influence ecological processes and the composition and distribution of wildlife resources, which will ultimately affect different wildlife user groups. These short-term impacts of coastal project will lead to long-term benefits. However, the needs of commercial wildlife resource users will not benefit from long-term gains since their needs are immediate. The LWF is starting to see an overall shrinking of resources, fragmentation of habitat and an overall decline in acreage. Habitat changes are affecting the availability of wildlife resources. Until recently, both commercial and recreational wildlife needs have been satisfied without conflicts over resource use. As land loss continues and habitat becomes more fragmented, LWF expects to see more conflicts over recreationally and commercially significant species. The LWF worries that the potential use of levees to protect from flooding, saltwater

intrusion, will affect how ecosystems work, and threaten the sustainability of wildlife habitat. Levees affect the life cycle of species and levees around marsh have unintended secondary consequences on wildlife habitat making this approach unsustainable.

How Well the Plan Meets Stakeholder Needs

The LWF feels that there are still winners and losers of the plan. Many of the immediate needs of LWF members are dependent on current land use patterns and water regimes. As a result, the plan will have short-term impacts to users that will ultimately lead to long-term sustainability gains. The LWF would like to see more projects that build marsh and barrier islands with dredged sediment and native vegetation. Furthermore, LWF would like to see the implementation of more oyster reef and sediment diversion projects to prevent further habitat loss. A needed priority of the plan is the prevention of further land loss by addressing the role that reducing CO2 emissions plays into preventing elevated sea level rise. This is a more sustainable approach than not addressing the role of CO2 emissions. The LWF pointed to the plans lack of specificity in how to manage the land loss issue as a weakness. However, the LWF feels that the plan has improved upon the planning process and did a better job articulating tradeoffs and setting priorities. The LWF also feels that the plan shows an improvement upon state leadership, lacking in past restoration efforts. The LWF expects to see a continued decline in habitat because not enough sediment diversions and ecological restorations have been committed; however, in 20 years LWF expects to see the beginnings of the stabilization of the coast.

Ecological Tradeoffs

According to the LWF, an ecological tradeoff of the plan is continued land loss in the near term. Continued land loss will put increasing pressure on existing resources leading to conflict between recreational and commercial uses of the land. Another potential ecological tradeoff is the secondary environmental impacts of the artificial preservation of traditional water regimes.

Audubon Society

The Audubon Society believes that “where birds thrive people prosper” their mission focuses on the habitats of birds and seeking to conserve and restore natural ecosystems, to promote biodiversity for the benefit of humanity (National Audubon Society). The Louisiana Audubon Society or LAS has 2 active chapters and 3,600 members in the state (National Audubon Society). The conservation approach of the Audubon Society is to follow the flyways of migratory birds (National Audubon Society). A conservation focus on birds lends a unique perspective because birds are at the top of the food chain and they live everywhere on the planet in every type of environment and climate, they have large ranges and migration routes giving a larger more holistic perspective.

The Louisiana coastal zone has 15 Important Bird Areas with global significance (National Audubon Society). The Louisiana Audubon Society, or LAS, is working to conserve 3 million acres of important bird habitat (National Audubon Society). Fifty percent of the bird species of North American use the Gulf Coast along their migration routes (National Audubon

Society). Louisiana is home to critical bird species that are endangered or endemic. The coastal zone serves as a major flyway along migratory routes. The Audubon Society is concerned with the lack of national attention to the land loss crisis (National Audubon Society).

The Audubon Society has been active in Louisiana since its' founding in response to the mass slaughtering of birds for decorative feathers that largely occurred in Louisiana in 1905. The LAS is a major landowner with one of the largest and oldest sanctuaries in the state and is part of the plans landowners' discussion group. The LAS explains that working with private landowners is essential to understanding coastal issues. The Louisiana and the National Audubon Societies are members of the coalition to restore the Mississippi River Delta. The Audubon Society along with the Wild Life Federation and the Environmental Defense Fund are valuable to the coalition because they can engage in the issues at both the state and the national levels.

Key Perspectives

Preferred Strategies for Reducing Flood Risk and Reversing Land Loss

According to the LAS, every project type is important; however, projects that maintain and restore barrier islands and shoreline protection projects promote important habitats for birds. These habitats are critical to birds because they serve as locations where large predators and urbanization is not a threat. LAS would like to see more river diversions on a larger scale to serve critical habitats cut off from the river. The Audubon Society “as a rule does not get involved in the levee discussion” or the discussion about risk reduction. The LAS acknowledges that levees are detrimental to habitat, cutting the land off from the river. These responses show, how the multiple lines of defense strategy discourages environmental stakeholders from risk reduction discussions and encourages environmental stakeholders not to challenge the ecological impacts of levees. As a result, environmental stakeholders are less likely to advocate for green infrastructure alternatives.

How Well the Plan Meets Stakeholder Needs

According to the LAS, this plan is an improvement upon coastal legislation that occurred between 1990 and 2005. LAS explains, that the current plan recognizes that the land loss problem needs more money and more resources than was originally anticipated. However, the plan lacks funding and needs to implement more sediment diversions. Bird habitats will benefit from barrier islands and shoreline protection projects because these project types support critical habitat for birds. However, habitats still cut off from the river will be lost. LAS views the plans acknowledgment of sea level rise as a triumph for a bipartisan planning process. The LAS expects that the land loss trend will continue but will be showing signs of stabilization. Furthermore, the LAS claims that there is still enough habitat left to sustain viable bird populations. Over the next 10 years, the LAS would like to see the commitment and implementation of large-scale sediment diversions, and the maintenance of barrier islands and habitats cut off from the river. In the 2017 update, the LAS asked for better ecology modeling for habitats, species and birds, more traction for nonstructural strategies, and more utilization of the focus groups created in the 2012 update.

Ecological Tradeoffs

According to LAS, “if Greenland and Antarctica melt projections come to fruition this may be too much sea level rise to cope with.” While the plan succeeds in recognizing sea level rise it does not address the role that CO2 emissions play in escalating projections of future land loss. An ecological tradeoff of the plan is that by promoting the continuation of fossil fuel industry in the region the plan is also promoting further emissions of CO2. As a result, sea level rise will escalate flood risk and land loss. Furthermore, by collaborating with the fossil fuel industry the plan limits its ability to discuss the true impacts of not regulating carbon emissions or the benefits of reducing emissions.

The Nature Conservancy

The Nature Conservancy or TNC, unique objective is to protect the land and waters on which all life is dependent. TNC believes in the use of the best available science and partners with government agencies, businesses, indigenous communities and other environmental organizations, on coastal restoration issues. TNC promotes the philosophy that good conservation is good for biodiversity and good for people who are part of nature. They also promote the philosophy that economies can thrive with good conservation, providing human health and livelihoods. TNC is a conservation organization active at the state, national and global scale (The Nature Conservancy, 2015). According to their website, TNC’s vision “is a world where the diversity of life thrives and people act to conserve nature for its own sake and its ability to fulfill our needs and enrich our lives”, (The Nature Conservancy, 2015). This philosophy is a departure from the Wildlife Federation and the Audubon Society who promote nature for human benefit.

TNC in Louisiana is working to reconnect the Mollicy Farms floodplain and Bayou to the Ouachita River. They are also working to acquire and manage the longleaf pine forest. Other initiatives include working to rebuild and extend Louisiana's coast using artificial oyster reefs, and reforesting marginal cropland in the Lower Mississippi Alluvial Valley (The Nature Conservancy, 2015). TNC has created the following Public Preserves, Limited Access Preserves, Freshwater and Terrestrial, and Estuarine Project Areas:

Figure 10 Table of The Nature Conservancies Locations of Conservation Efforts

The Nature Conservancies' Public Preserves		
Abita Creek Flatwoods Preserve	Grand Isle Preserve	Mary Ann Brown Preserve
Cypress Island Preserve	Lake Ramsay Preserve	
The Nature Conservancies' Limited Access Preserves		
Caddo Black Bayou Preserve	Persimmon Gully Preserve	Frederick's Swamp Preserve
Bayou Dorcheat Preserve	Summerfield Springs Preserve	Lake Cocodrie
CC Road Savanna Preserve	Talisheek Pine Wetlands Preserve	Pushepatapa Preserve
Copenhagen Hills Preserve	Charter Oak Preserve	Schoolhouse Springs Preserve
The Nature conservancies' Freshwater and Terrestrial and Estuarine Project Areas		
Atchafalaya Basin	Mollicy Farms	Pearl River
Coastal Prairies	Oyster Reef	Red River
Mississippi Delta	Restoration	

(The Nature Conservancy, 2015).

Key Perspectives

Preferred Strategies for Reducing Flood Risk and Reversing Land Loss

The TNC has championed the living shorelines or oyster reefs first line of defense project. Furthermore, TNC believes natural or “green infrastructure” solutions “should be used wherever possible” and proposes a community rating system that accounts for resiliency in green infrastructure strategies. TNC also believes that it is important to restore the connections to the river with sediment diversion and hydrologic restoration projects. Additionally, TNC thinks that levees “should be done in a way that protects people but be placed so that they do not further disconnect the land from the river”. Similarly, TNC supports the multiple lines of defense strategy as a concept explaining that the application of this strategy must ensure that the placement of different strategies is strategic to prevent further habitat destruction. TNC’s position of championing green infrastructure projects such as living shorelines shows their willingness and ability to challenge the status quo and push the envelope on untested projects.

TNC views the role of industry in coastal restoration as potential partners and leaders. However, TNC explains that the biggest challenge of restoration efforts from a working coast perspective is to achieve true “buy in” from industry and government. TNC explains that this requires a “paradigm shift”. TNC argues for the need to safe guard against “restoring the coast only to dig it up again”. TNC explains that the sustainability of this approach depends upon consistency across the board, the plan must safe guard against the exploitation of the restored habitats. This will not happen if industry externalities are not mitigated. This response highlights the need for industry to step up to a leadership role in restoration rather than just participant in the planning process. Furthermore this response highlights the need for the plan to more clearly define what a “working coast” looks like and what additional safe guards will be put in place to prevent the continued destruction of wetland habitats from industry activity.

How Well the Plan Meets Stakeholder Needs

TNC feels that the plan has some good strategies and the stakeholder involvement is good; however, TNC would like to see further championing of green infrastructure solutions. The plan fails in its monitoring approach that focuses on commercially significant species rather than functional groups of species. TNC explains that this approach is inconstant with the most recent academic research on the subject. The plan also fails to achieve connectivity with fresh water resources further inland that are also cut off from the river and important to restoration. In the 2017 update, TNC would like to see “further refinement of the science side of the plan”, and improvements to the connectivity of freshwater resources of the coast by integrating the Coastal Master Plan into statewide water planning.

Ecological Tradeoffs

According to TNC, one of the ecological tradeoffs of the plan is its limited spatial focus on the coastal zone and its lack of connectivity to inland fresh water resources. Additionally an ecological tradeoff of this plan is its choice to monitor only top predator species rather than functional groups. TNC has been involved in the master plan’s monitoring components. They explain that the focus in management and monitoring has been on commercially or recreationally significant species, often the top predators. TNC recommends an alternative approach that monitors functional groups of species rather than just commercially significant ones. Academic literature shows how this approach promotes ecosystems that are more resilient.

Environmental Defense Fund

The Environmental Defense Fund, or the EDF, is concerned with environmental, economic, and social aspects of restoration issues. EDF engages regularly with the state and the communities. The EDF in partnership with the Coalition to Restore the Louisiana Delta has chosen 19 priority projects that it feels will have the greatest impact on restoration and stabilization of the coast. These 19 priority projects include multiple land building and protection strategies.

Key Perspectives

Preferred Strategies for Reducing Flood Risk and Reversing Land Loss

According to the EDF, all project types serve their own function and are appropriate in specific locations. However, the EDF recognizes that the plan does not do enough to restore ecological functions. The EDF feels that the plan’s decision-making process is robust because of its technical analysis; however, project prioritization is unclear. The plan limits public debate on project prioritization by failing to state how the plan prioritizes funding.

How Well the Plan Meets Stakeholder Needs

The EDF feels that the current plan shows an increased commitment to fund projects compared to past legislative efforts. The EDF feels that the plan’s strength is its technically based approach. The EDF explains that the plan is a publicly informed, comprehensive look at

coastal projects. However, the plan is weak in its lack of a clear time line for implementation outlining expected progress. The exclusion of this information limits the ability of the public to hold the plan accountable. The EDF expects the BP settlement money will lead to more projects implemented, particularly sediment diversions. In the 2017 update, the EDF would like to see improvements in the scientific modeling used for project selection. Furthermore, the EDF would also like to see clear expectations stated in the plan at 5-year benchmarks for the first 20 years stating what the plan expects to achieve.

Ecological Tradeoffs

According to the EDF, an ecological tradeoff of the plan is a lack of transparency in project prioritization. The plan also fails to set benchmarks of what we can expect the plan to achieve over time.

Gulf Restoration Network

The Gulf Restoration Network, or GRN, approaches the coast from the perspective of the clean water act. GRN also views coastal issues from a gulf wide standpoint. GRN works to look beyond state boundaries when considering environmental benefits and impacts. GRN promotes the philosophy that, the actions taken in one gulf coast state are not confined to that political boundary but can affect coastal issues in neighboring Gulf States.

The GRN website states, “Gulf Restoration Network’s work spans issues ranging from holding BP accountable for its drilling disaster to helping restore the coastal lines of defense to help protect our communities from storm surge and sea level rise” (Gulf Restoration Network). GRN considers itself the most aggressive environmental organization working towards the defense of the coast. GRN is willing to challenge government decision and hold government agencies and industry accountable. GRN is a 501c3 with a focus on education and outreach, offering technical support to the community. GRN helps to organize the public around coastal issues and collaborates with the Sierra Club on lawsuits.

Key Perspectives

Preferred Strategies for Reducing Flood Risk and Reversing Land Loss

When asked about project preferences GRN replied that they would like to see more projects that use the “living coast approach”. These projects use oyster reefs in place of conventional breakwaters. GRN explains that oyster reefs are lighter and do not sink as much as rock used in traditional breakers, they also filter water for fish. GRN would also like to see more oil canals repaired. GRN explains that the 2012 plan did not evaluate this strategy. The 2017 update will evaluate projects that repair oil canals; however, GRN feels that this evaluation “should be expanded beyond just evaluating spoil banks”. Furthermore, GRN also feels that the restoration of fresh water marshes needs to be included in the plan because healthy marshes can grow with sea level rise. Lastly, GRN would like to see the evaluation of soils in the plan, explaining that soils are important to ecology and elevation, and the 2012 plan failed to incorporate soils into the models.

The primary concern GRN has for restoration from a working coast perspective is the necessary balance of power between environmental and economic needs and concerns. GRN claims that presently there is an imbalance of power in favor of destructive industry practices and that there has never been a balance in the Louisiana coastal zone. GRN disagrees with the rhetoric of balance when you consider impacts from oil spills. GRN claims that true balance would require the enforcement of restoration best practice and greater leadership at the state level. Furthermore, GRN believe that the working coast approach should not allow industry practices that have a negative impact on restored wetlands. GRN explains that a major driver of coastal land loss is sea level rise and the regulation of carbon is a crucial tool to addressing this aspect of coastal restoration, which is a threat to the profitability of the industry. Sea level projections in the plan assume the regulation of carbon. This assumption would require oil companies to leave eighty percent of oil reserves in the ground. Such regulation would threaten the existing business model of the fossil fuel industry. GRN thinks that the plan “needs to explicitly address the regulation of carbon”.

Another concern GRN has about the working coast approach is the failure to enforce existing laws such as the coastal management act. GRN argues that the oil and gas companies owe Louisiana a land debt quantified by the USGS. GRN explains that the law requires drilling companies to “restore detoxify and re-vegetate lands affected by their activities”. However, most oil fields remain unrepaired. GRN supports the lawsuits of the coastal parishes and the levee boards against the oil and gas industry. GRN explains that landowners sue oil companies and win once they get the facts in front of a judge. GRN believes that the oil industry should pay for the twenty billion dollars of marsh creation in the plan, and that the industries actual liability is between one hundred and five hundred billion dollars of damage; however, courts need to enforce the laws that have been broken. Another concern GRN has is that the Louisiana government does not listen to science when it is not favorable to the oil industry, suggesting collusion between the Louisiana legislature and the Louisiana Department of Natural Resources with the oil and gas industry. This response further highlights the imbalance of power between industry and the environment.

How Well the Plan Meets Stakeholder Needs

GRN approves of the planning process; However, GRN believes that there is some political influence around project selection pointing to the “morganza to the gulf levee” as an example of a poorly placed project. GRN feels that the areas that the state wants to repair is very small in comparison to how much more we are capable of restoring. GRN explains that 3 to 4 miles of wetlands can reduce storm surge by a foot; thus, it is ultimately cheaper to save what we have before it is lost then to rebuild the land if the ultimate goal is to stabilize the coast and keep Louisiana habitable. GRN believes that the oil industry should pay for the twenty billion dollars of marsh creation in the plan, and that the Industries actual liability is between one hundred and five hundred billion dollars of damage. Furthermore, sea level rise projections in the plan should be consistent with the academic research and clearly state when projections have assumed carbon regulation or a no action carbon scenario. GRN anticipates continued land loss. In the 2017 update, GRN would like to see land loss projections for the worst-case scenario of sea level rise. Sea level rise projections in the plan should be consistent with the academic research. GRN

would also like to see stated in the plan the physical limitations of sand in the river with restoration and “address environmental care of sand bars in the river explicitly stating oil terminals should not be placed on sand bars”.

Ecological Tradeoffs

According to GRN, an ecological tradeoff of the plan is the existing barriers to regulation, enforcement, and reparations of the coastal management act. These barriers to action are a direct result of the partnerships with powerful industries whose economic externalities cannot be mitigated by the plan without significantly disrupting the status quo. Additionally, the working coast approach lends itself to an imbalance of power influencing all aspects of the planning process from project selection to transparency in the plan about contentious issues.

Environmental Stakeholders Analysis and Major Themes

This section organizes the analysis of environmental stakeholder responses around three major themes associated with the three research questions of this study. Tables made for each theme of analysis organize the responses of the economic stakeholders for comparison. Environmental stakeholders support all projects that restore habitat or ecological functions. TNC is the most progressive in advocating new green infrastructure strategies, and GRN is the most challenging of the plans scope. Environmental stakeholders agree that the plan is an improvement on past efforts; however, each group highlights areas where the plan still needs to be improved.

Preferred Strategies for Reducing Flood Risk and Reversing Land Loss

Figure 11 below shows the responses of different stakeholder groups on different project types. Environmental stakeholders’ primary concern for the coast is the restoration and sustainability of coastal habitats. As a result, their focus is on land building projects rather than risk reduction. This focus removes the discussion of levees and their impacts on wetland habitat. Environmental stakeholders acknowledge that levees disconnect the land from the rivers natural processes; however, the multiple lines of defense strategy of project placement mitigate the threat of expansion of these structures. Similarly only one environmental stakeholder, the Audubon Society, mentioned nonstructural protections as a project type that needed more support. Marsh creation is the project type most easily created and funded. While ecological restoration projects are more expensive with less immediate results, these projects were of the highest priority to all of the stakeholders groups with the exception of the Gulf Restoration Network whose focus was the repatriations of abandoned oil and gas canals. Sediment projects in general were in high demand for environmental stakeholders. Another project type championed by environmental stakeholders is living shorelines, which uses oyster reefs in place of conventional breakwaters. The Gulf Restoration Network and the Nature Conservancies recommended the expansion of the plans scope to include the restoration of fresh water marsh and inland resources.

Figure 11 Table of Environmental Stakeholders Responses on Project Types

Environmental Stakeholder Groups	Project Selection						
	Levees	Restoration of Ecological Processes	Land Building From Dredged Sediment	First Line of Defense	Marsh Creation	Non Structural Protections	Other
The Louisiana Wildlife Federation (LWF)	Fears the use of levees to preserve water regimes	Impacts wildlife resource users	Plan needs more of these types of proects	Important project type for wildlife habitat	Provides important habitat for wildlife users	No comment	No comment
The Louisiana Audubon Society (LAS)	Declines to take a stance on levee issue	Plan needs more sediment diversions on a larger scale	Plan needs more of these types of proects	Important bird habitat	No comment	need more traction for nonstructural strategies	No comment
The Nature Conservancy (TNC)	Believes that green infrastructure alternatives strategies should be used where ever possible	Plan needs more sediment diversios and hydrologic restoration	Plan needs more of these types of proects	Championed the oyster reef project	No comment	No comment	Community rating system that accounts for resiliency in green infrastructure strategies
Environmental Defense Fund (EDF)	Supports multiple lines of defence use of levees	Plan needs more of these types of proects	No comment	No comment	No comment	No comment	No comment
The Gulf Restoration Network (GRN)	Believes that levees should not be placed in inapropriate locations due to political influence	No comment	Plan needs more of these types of proects	More oyster reef projects	restoration of fresh water marshes needs to be included in the plan	No comment	Repair oil and gas canals

Figure 12 shows environmental stakeholders views on the working coast approach. Environmental stakeholders support the theory of restoration efforts from a working coast perspective. However, implementation of these strategies requires a delicate balance of power and without this balance, the strategy is not beneficial to restoration efforts. Coastal industries have failed to step up as true partners in restoration efforts thus far. GRN was most vocal about the need for the oil industry to pay for restoration.

Figure 12 Table of Environmental Stakeholders Views on the Working Coast Approach

Working Coast Approach			
Environmental Stakeholder Groups	Supports Theory	Supports Increased Environmental Protections	Agree that Plan Balances Ecological and Economic Needs
The Louisiana Wildlife Federation (LWF)	Yes	Yes	No
The Louisiana Audubon Society (LAS)	Yes	Yes	No
The Nature Conservancy (TNC)	Yes	Yes	No
Environmental Defense Fund (EDF)	Yes	Yes	No
The Gulf Restoration Network (GRN)	Yes	Yes	No

How Well the Plan Meets Stakeholder Needs

Figure 13 shows the views on the environmental stakeholders on the plans ability to address coastal issues. Across the board, environmental stakeholders have expressed great concern for the level of habitat loss that the coastal zone is experiencing and environmental stakeholders expect the land loss trend to continue. Stakeholders agree that the current plan has improved upon past legislation efforts. Environmental stakeholders point to the plans improvements in the planning process as its strength. However, each stakeholder pointed to various weaknesses and shortcoming where the plan still needs improvement such as, accountability, transparency, funding mechanisms, and expansions in scope. Additionally, the plan fails to commit enough ecological restorations and land building projects to prevent near term land loss. Many stakeholders would also like to see improved scientific modeling.

Figure 13 Table of Environmental Stakeholders Views on the Effectiveness of the Plan

Environmental Stakeholder Groups	Expect Continued Land Loss	Improved Upon Past Legislation	Satisfaction With the Plan		2017 Update
			Strength	Weakness	
The Louisiana Wildlife Federation (LWF)	Yes	Yes	Improved planning process, Improved articulation of tradeoffs and setting priorities	Lack of specificity in how to manage the land loss issue	
The Louisiana Audubon Society (LAS)	Yes	Yes	Plan acknowledges of sea level rise	Plan needs money and more sediment diversions	Better ecology modeling, more utilization of the focus groups
The Nature Conservancy (TNC)	Yes	Yes	stakeholder involvement	Plan fails to achieve connectivity with fresh water resources further inland	Refinement of the science side of the plan, integrating the Coastal Master Plan into statewide water planning
Environmental Defense Fund (EDF)	Yes	Yes	Technically based approach, publicly informed, Comprehensive	Lack of a clear time line for implementation	Improvements in the scientific modeling used for project selection, clear expectations stated in the plan at 5-year benchmarks for the first 20 years
The Gulf Restoration Network (GRN)	Yes	Yes	approves of the planning process	Area that the state wants to repair is very small in comparison to how much more we are capable of restoring	land loss projections for the worst-case scenario of sea level rise

Ecological Tradeoffs

Figure 14 shows the views of environmental stakeholders on the ecological tradeoffs of the plan. Concern for climate change, sea level rise, and carbon emissions was a common theme across stakeholder groups when asked about the sustainability of the plan. Environmental stakeholder groups also called for greater state leadership and for industry to take a more active role in restoring wetland habitats. Stakeholder groups also agreed upon the need for improved scientific modeling in the 2017 update and for project timing prioritization and funding to be clearer in the updated plan.

Figure 14 Table of Environmental Stakeholders Ecological Concerns about the Plan

Ecological Tradeoffs			
Environmental Stakeholder Groups	Ecological Tradeoff	Ecological Consequence	Recommended Mitigation
The Louisiana Wildlife Federation (LWF)	Continued land loss	Increased pressure on existing resources leading to conflict between recreational and commercial uses of the land	Commit more ecological restoration projects and sediment projects
The Louisiana Audubon Society (LAS)	increased sea level rise, increased storm intensity from regions commitment to fossilfuel industry	escalated flood risk and land loss	discuss the regulation of carbon in the plan and how this influences emission and sea level rise scenarios
The Nature Conservancy (TNC)	limited spatial focus on the coastal zone and its lack of connectivity to inland fresh water resources	Habitat further inland continues to be cut off from the river	integrating the Coastal Master Plan into statewide water planning
The Nature Conservancy (TNC)	monitor only top predator species	Species with less human value may be over looked and decline habitats may become less resilient	Monitor functional groups of species
Environmental Defense Fund (EDF)	lack of transparency in project prioritization, failure to set bench marks and time line	less public debate about what projects should be implemented first, less accountability about what we can expect the plan to achieve	clear expectations stated in the plan at 5-year benchmarks for the first 20 years stating what the plan expects to achieve
The Gulf Restoration Network (GRN)	barriers to regulation, enforcement, and reparations	Continued habitat destruction and land loss from failure to enforce coastal management act	Enforce coastal management act and address power imbalance between oil and gas industry and other stakeholders

Planning Theory

Based on Arnstein’s theory on participation, the participation process of the 2012 plan for environmental stakeholders falls under the tokenism category. While the stakeholders were consulted they do not have any decision making power and while modeling was used to select the projects that resulted in the most risk reduction and land building potential, industry values were also used to influence project selection which was ultimately up to the decision makers.

Arnstein explains that a characteristic of tokenism is consultation without decision-making power.

The three primary conflicts of interest discussed in Campbell's sustainability theory are reflected in the responses of environmental stakeholders. Campbell's resource conflict is represented in environmental stakeholders' expectation of preserving wetland restored by the plan and economic stakeholders' expectation to be able to continue industry activities without mitigation of economic externalities and ecological tradeoffs. The property conflict is apparent in environmental stakeholders desire to promote sustainable land uses while economic stakeholders wish to preserve historic land uses. The development conflict will become more pronounced as available resources shrink with continued land loss.

John Forester argues that a scientific approach to planning risks technical success without considering sustainability and environmental quality. This environmental planning approach has incorporated planning theory with a scientific approach. The plans ability for the plan to achieve a sustainable outcome is greatly influenced by its quality of effective negotiation. The plans economic externalities and ecological tradeoffs reflects the plans failure to negotiate a sustainable plan; thus, even with technical success the plan will fail to achieve environmental quality.

Chapter 6 Conclusion

This study investigates the Louisiana 2012 Coastal Master Plans ability to reconcile economic and ecological demands on coastal resources. The study found that while economic and environmental stakeholders support the theory of a working coast approach they have diverging visions of what that should look like. The mitigation side of the plan is insufficient to support a sustainable working coast. The study found that the plans support of corporate interests increases barriers to action and increases the ecological tradeoffs of the plan, which negatively affects wildlife resource users. The study found agreement between several environmental and economic groups on flood risk and land building values with divergence in preferred strategies for action. Environmental groups proposed more sustainable ecologically conscious project types than economic groups. Lastly, this study found that the plan does not mitigate the externalities of industry activity in the coastal zone. Furthermore, these ecological tradeoffs are not transparently articulated in the plan. The plan improves upon past efforts; however, it has not yet reconciled the conflicting motivations of environmental and economic stakeholder groups. Each five-year update presents an opportunity to improve upon the planning process. However, this is a time sensitive issue, as more land is lost the window of time to create a sustainable partnership between economic and environmental interests gets smaller and smaller.

Preferred Strategies for Reducing Flood Risk and Reversing Land Loss

The primary source of contention between interest groups is project selection and project prioritization. Conflicts arise when addressing the true cost of preventing land loss and reducing flood risk vs. how much funding is available. Furthermore, determining a project's prioritization is a topic of contention between stakeholder groups. The plan does not clearly define this decision making process. Marsh creation and first line of defense projects are the least contentious and these projects serve the needs of all parties, they are relatively affordable and easy to implement when compared to ecological restoration projects. The primary barrier to these types of projects is the cost of transporting dredged sediment. All parties interviewed agreed that the stabilization of the coast requires the implementation of more ecological restoration and the transportation of dredged sediments. The navigation industry is the primary barrier to ecological restorations because diversions affect long standing maritime practices such as anchorages. For further restorations to happen, the navigation industry must accept some economic tradeoffs in exchange for offsetting their ecological impact. This would require greater leadership from the state or increased political will to shift priorities. The plans lack of designated funding mechanisms is the primary barrier to the transportation of dredged sediments for land building efforts.

A working coast perspective does not work if there is not a balance between industry and ecology. Depending on the issue environmental and economic stakeholders have opposing needs and concerns for the coast. However, Many restoration projects are mutually beneficial. LWF and the LLA and the UCFA have overlapping constituents. A partnership between these parties would be beneficial. LWF values commercial resource use in its mission but offers a more sustainable long range vision that would balance immediate profit driven concerns that could pose a threat to long term sustainability. TNC and the LLA both value community resiliency, but

have opposing visions of risk reduction strategies. The TNC has proven to be an advocate for the promotion of green infrastructure alternatives to risk reduction in their development of the living shorelines strategy for first line of defense. Partnership between these groups on green infrastructure alternatives for risk reduction offers a more sustainable approach. GRN and LOGA are most opposing in their views. GRN is also the only environmental organization in this study who was not invited to participate in one of the 2012 focus groups. Allowing GRN to play a more prominent role in the planning process would offer an opposing position that could serve to balance the planning process. The plan's greatest strength is its ability to bring the major economic and environmental players together; however, greater leadership from the private sector and stronger partnership between environmental and economic groups are needed to mitigate continued decline.

A working coast approach also requires state and federal leadership to hold industry accountable to existing laws and is not possible if in fact collusion does exist. Currently economic stakeholders use the rhetoric of a working coast approach because industry will ultimately pay for restoration; however, no mechanism has been established for industry to finance the plan without environmental lawsuits, and no industry has stepped up as a leader with an alternative approach to fund projects. Waiting for coastal industries to fund restoration projects on a voluntary basis is unlikely to prove financially viable. However, enforcing existing environmental law and holding the oil and gas industry accountable for their land debt would be greater than the plan's current budget. Currently industry leadership is on the side of protecting their interest rather than on the side of sustainable business practice. Across the board, the industries within the coastal zone advocate for less regulation and the maximization of profits. A balanced restoration effort from a working coast perspective would require the plan to address the environmental externalities of industry activities in the coastal zone. For this to happen, greater leadership from the state is needed to enforce existing environmental laws and implement new ones as needed.

How Well the Plan Meets Stakeholder Needs

Because of the fiscal constraints of the plan, the prioritization of project implementation will determine the winners and losers of the plan. Currently the plan protects the interests of larger, more powerful corporations and industries better than small business within the coastal zone. This is shown by the fact that the plan protects the critical infrastructure of the oil and gas industry and navigation, while, it has implemented very few ecological restoration projects to serve the needs of the fishing industry and the private landowners who are not corporations associated with the aforementioned industries. This suggests that larger corporations associated with the oil and gas industry and the navigation industry have more influence or are a higher priority to the plan than smaller business associated with wildlife resource users and the fishing industry. The plan's failure to mitigate the economic externalities of the oil and gas industry and navigation also reflects the imbalance of power in the planning process.

It is smaller businesses associated with fishing and wildlife resource industries that present the best chance at a sustainable partnership in the coastal zone. The needs and concerns of these industries align most closely with those of environmental stakeholder groups. The future viability of these industries depends on the sustainability of the plan. However, changes in the

distributions of resources caused by project footprints and changes in water regimes due to rising sea levels will still affect these industries. Forced maintenance of historic land uses threatens wetland habitats ability to adapt to climate change. The plans economic checks will be tested as landowners and fishermen demand the engineering of structures that artificially control water regimes and the distribution of resources.

As wetland habitats continue to shrink, conflicts between resource users will also increase. This will make projects that affect species composition more contentious. Every project has a footprint that will influence ecological processes and the composition and distribution of resources, which will ultimately affect different user groups. Projects with long-term benefits will have short-term impacts that will affect people whose livelihoods are dependent on coastal resources. The most sustainable projects will have to allow habitats to shift with changing climatic conditions. This will require flexibility for resource users that will accommodate recreational users better than commercial ones

Ecological Tradeoffs

The ecological tradeoffs of the plan result from the plan's failure to mitigate the economic externalities of industry activities in the coastal zone. The sustainability of the plan is dependent on its ability to mitigate economic externalities. Ultimately the plan needs to be more transparent about what it will and will not achieve and why. The plan does not state the timing of project implementation, or possible sources of funding. Currently the plan is unclear about its distribution of financial responsibility across government, industry, and the taxpayer. There are some obvious holes in the plan. The plan fails to address existing damage from the oil and gas industry or the financially liable party for these reparations. The plan also fails to address the unacceptable practice of dumping dredged sediment in the gulf because no one wants to pay for sediment transport. Lastly, the plan fails to address the consequences of not regulating carbon. These issues directly affect the success of the plan.

Planning Theory

The participation process of the 2012 plan falls short of citizen control. Economic and environmental stakeholders are consulted but ultimately do not have a say in the decision making process. Additionally the process is not redistributive of power and influence. The plan has set up a framework where all parties have an opportunity to express their needs and concern; however, project selection and prioritization favors the more powerful industries of oil and gas and navigation over the fishing industry, wildlife resource users and other small businesses. A process that reflected the values of citizen control would need to redistribute power from large corporate interests to support local livelihoods. Additionally citizen control would require citizen to have some decision making power.

Campbell's property, resource and development conflicts contain common interests within them with opportunities for sustainable collaboration for mutually beneficial action (Campbell, 1996). Partnerships across economic and environmental stakeholder groups with overlapping objectives would create the opportunity for more sustainable approaches to common goals. To resolve the property conflict a more flexible property model needs to be created to enable wildlife resource users to have access to the same land use activities while letting habitats

shift. This would also remove some contention around the impacts of project foot prints that restore ecological processes such as diversions. To resolve the resource conflict the plan needs to more clearly define the working coast approach in terms of regulation and funding mechanisms. The best way to resolve the development conflict from becoming more pronounced is to prevent further land loss through industry leadership or through further government action. Additionally the plan and the state need to champion sustainable industries so that people are not forced to choose between the environment and their livelihood. Furthermore, addressing the carbon problem would open up the discussion for how the state can promote more sustainable energy jobs.

The plan has succeeded in addressing some of John Forrester points on a good planning process. The plan has combined technical analysis with participation; the plan has succeeded in creating a participation process that encourages a strong level of participation from all sides. However the plan falls short in its ability to achieve effective negotiation on mitigation of externalities and ecological tradeoffs. The plan also fails to achieve a win-win scenario that reverses the land loss trend. Additionally, the plan fails to promote joint action from both economic and environmental stakeholder parties. Furthermore, the plan does not create mechanisms for funding or next steps for action.

John Forester argues that a scientific approach to environmental planning risk technical success without considering sustainability and environmental quality. This environmental planning approach has incorporated planning theory with a scientific approach. The plans ability for the plan to achieve a sustainable outcome is greatly influenced by its quality of effective negotiation. The plans economic externalities and ecological tradeoffs reflect the plans failure to effectively negotiate thus even with technical success the plan will fail to achieve environmental quality.

The Coastal Master Plan has improved upon past restoration efforts and has the opportunity to improve with each 5 year update. The plan created a framework for participation that can be improved upon to encourage effective negotiation, and cross sector partnerships for joint action. Currently the plan accepts many ecological tradeoffs and few economic tradeoffs. A sustainable plan would require that industries accept that some economic tradeoffs are required to prevent further land loss. The major barriers to action come from the imbalance of power between stakeholders and stakeholder groups. The plan cannot reconcile the conflicts of interests between the oil industry and restoration. The carbon problem needs to be acknowledged by the plan so that the consequences of carbon action or non-action can enter the public debate.

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