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Transforming Sustainability thru Adaptive Co-Management: A Critique of Louisiana's Coastal Master Plan

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Transforming Sustainability thru Adaptive Co-Management:
A Critique of Louisiana's Coastal Master Plan

A Thesis

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

Master of Urban and Regional Planning

by:

Melanie G. Sand

Bachelor of Urban Planning and Development, Ball State University 2009

August 2012

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Abstract

To achieve true sustainability, planners must balance the interests of environmental protection, economic development, and social equity. In a critically changing, complex ecosystem such as Louisiana's coast, challenges to achieve the perfect equilibrium are further compounded. Following the logic of emerging adaptive co-management literature, the planning framework for Louisiana's Coastal Master Plan could be transformed into a more collaborative, democratic process. Adaptive co-management is a regime which provides power to local citizens, often in possession of invaluable traditional ecological knowledge. In general, it focuses on constant learning and collaboration. Through power-sharing and participatory action, we embrace science, but step back from technocracy. We utilize local knowledge, and combine it with expertise.

Environmental Planning, Louisiana's Comprehensive Master Plan for a Sustainable Coast, Adaptive Co-Management, Coastal Management, Plan Evaluation, Sustainability, Citizen Participation

Chapter I

Introduction

The Coastal Protection and Restoration Authority (CPRA) released the draft of Louisiana's 2012 Coastal Master Plan on January 12, 2012, citing a land loss crisis requiring swift action. Whether or not the 2012 Coastal Master Plan achieved the maximum land building capacity is a matter of speculation. Nonetheless, the goal of any plan responsibly touting sustainability is to equally balance consideration for economic development, environmental protection, and social equity.

Louisiana's 2012 Coastal Master Plan utilized technical models self-proclaimed to be the most advanced science and technology available for coastal land building purposes. I will argue that this method is not sustainable, however, because the plan relied more heavily on economic and environmental considerations than social ones. A number of local citizens, plagued with frustration, feel that the participatory process aligned with the drafting of Louisiana's 2012 Coastal Master Plan amounted to little more than a form of tokenism, leaving the fate of their region in jeopardy. More specifically, participation within public hearings was a form of consultation, where officials received public input, but are in no way required to use input received.

In response to public criticism, this thesis will focus on an alternative form of natural resource management—adaptive co-management—which is successfully embraced in various regions of Europe and Canada. The hypothesis of this thesis, therefore, is that adaptive co-

management would constitute a more effective, sustainable, and democratic form of governance for the management of social-ecological systems in coastal Louisiana.

Purpose of the Study

The intent of this thesis is to bring attention coastal restoration planning in Louisiana, and progressive ways to improve Louisiana's Comprehensive Coastal Master Plan for a Sustainable Coast from an angle of social equity. A more general purpose is to provide a prelude for further, comprehensive study on the potential for adaptive co-management in coastal regions of the U.S. Throughout the study, the analysis will consider three main research questions: (1) How does adaptive co-management function as a framework for natural resources planning and management? (2) What are the strengths and weaknesses of Louisiana's 2012 Coastal Master Plan and its policy framework? (3) How could adaptive co-management reform Louisiana's Coastal Planning process?

Chapter II describes the exploratory research methodology utilized for this study and the logic linking the data to the initial research questions. It addresses the challenges of sampling and validity, and describes the plan's method of evaluation. Chapter III offers a background to Louisiana's coastal crisis and the roles of the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) and the Coastal Protection and Restoration Authority (CPRA) to set up a comparative basis between current and potential governance frameworks. This chapter will segue from current affairs to hypothetical paradigms in the next chapter. A literature review exploring an alternative approach known as adaptive co-management will be introduced Chapter IV. Chapter V offers an integrated plan evaluation, while Chapter VI assesses the plan for sustainability and public participation. Finally in Chapter VII, a set of recommendations for an

alternative adaptive co-management framework, discussion, and a conclusion will close the exploratory study.

Chapter II

The Methodology

In response to Louisiana's coastal crisis, the State faces an imperative to reverse the continuing trends of land loss and inundation. The State agency, CPRA, compiled a Coastal Master Plan in 2012 to address these challenges and prepare for the future. Over the next 50 years, the plan estimated a potential loss of 1,750 square miles of land if nothing is done. This is in addition to the 1,880 square miles of land loss experienced in the previous 80 years (CPRA 2012a:18). CPRA claimed that the plan demonstrated the "best use of dollars based on what we know today" (28). The Coastal Master Plan, however, is not and does not claim to be infallible. In fact, constructive criticism, for the sake of improvement, will illustrate a high level of remaining social risk and uncertainty despite the best ecological modeling software available.

To understand the methodology, it must first be clarified that the topic is qualitative and exploratory in nature and depends upon the development of theory. The results of the 2012 Coastal Master Plan are yet to be seen, but the efficacy of the plan can be explored through the utilization of established planning theory. A background in Chapter III introduces the value of Coastal Louisiana's resources, physical threats facing the region, legislation regulating coastal restoration, and the state agency tasked with the creation of Louisiana's Coastal Master Plan.

Research within the literature review of Chapter IV explores the first research question: How does adaptive co-management function as a framework for natural resources planning and management? This segment provides a prelude to adaptive management by discussing changing paradigms of democracy and resilience in postindustrial U.S. history. Adaptive co-management frameworks, limitations, and case studies support recommendations later to come in the text.

Key lessons are summarized at the end of the chapter. Data for this segment was gathered through peer-reviewed scholarly research on adaptive co-management.

The hypothesis in the introduction states that adaptive co-management would constitute a more effective, sustainable, and democratic form of governance for the management of social-ecological systems in coastal Louisiana. The analysis, therefore, must take a three-pronged approach. First, it must evaluate efficacy as a general master plan. Then it must define and critique sustainability within a plan. Finally, it must assess democracy in the form of citizen participation levels and citizen perceptions.

Chapter V evaluates efficacy through a plan critique. The introduction will first follow a content analysis approach to discern the priorities of the Comprehensive Coastal Master Plan for a Sustainable Coast. Content analysis is defined as “a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the context of their use” (Krippendorff 2004:18). These inferences set the stage for the plan critique, or evaluation.

Evaluation of the 2012 Coastal Master Plan will explore the second research question: What are the strengths and weaknesses of the 2012 Coastal Master Plan and its policy framework? It will follow the logic of William C. Baer’s article, “General Plan Evaluation Criteria: An Approach to Making Better Plans” (2007). Baer emphasizes the importance of knowing who is conducting the analysis and the status of his or her relationship to the plan authors. In this case, the evaluator is a professionally and academically trained Urban and Regional Planner without a personal or professional relationship to primary plan authors. Baer also questions when the evaluation is undertaken. Because the plan was accepted by the Louisiana Legislature in March of 2012, mere months before this critique was submitted, a plan

critique (i.e., as opposed to a post hoc plan outcome evaluation) is the most appropriate form of evaluation. According to Baer, a plan critique occurs after a plan's publication, but before it has had time to be put into practice, and before measurable results have occurred (330). Finally, Baer refers to the *what* of the evaluation, which takes various forms:

- 1) the substance of plan alternatives; and/or
- 2) the plan as a package—including the document that communicates:
 - i) goals and objectives
 - ii) needs or problems
 - iii) assumptions and methods of reasoning
 - iv) specific proposals
 - v) perhaps, implementation devices (ordinances, budgets, etc.) and/or
- 3) the outcome following plan implementation. (330)

For the 2012 Coastal Master Plan, as critiqued in this thesis, the content area will be the plan as a package; particularly it will focus on social equity concerns and citizen involvement relative to the document's creation. The focus lies in the forces leading to the plan, and not the biophysical implications of particular coastal restoration techniques.

Furthermore, Baer and his colleagues Jamous and Peloille assert that much of a plan critique rests on the particular qualities of the planner conducting the evaluation:

The criteria being invoked by the critic are individual, implicit, and somewhat idiosyncratic, being based on the critic's individual *virtualities*—his or her art of judgment and conceptive powers (Jamous and Peloille 1970; cited in Baer 2007:330-331). The topics covered also depend upon the critic, but include the three content areas listed above, and usually emphasize the second one—the plan as document that communicates substance. (Baer 2007:331)

Here, it is important to clarify that the particular focus of this plan critique rests on the efficacy of traditional citizen involvement methodologies applied to environmental planning, and general social equity concerns. Again, the thesis or hypothesis is that the participatory process amounted to a form of tokenism, which led to an unsustainable plan. In light of the hypothesis, this particular plan critique sets itself apart from others by virtue of its unique angle.

With this in mind, Baer provides some suggested general criteria for plan assessment, which will be incorporated in the analysis, and is referenced in full in Chapter V. General criteria include adequacy of context; “rational model” considerations; procedural validity; adequacy of scope; guidance for implementation; approach, data, and methodology; quality of communication; and plan format. Evaluating each question within the general criteria will yield answers to the second research question: What are the strengths and weaknesses of Louisiana’s 2012 Coastal Master Plan and its policy framework? Within Chapter V, the answer to each individual question is available. Depending on the answer, each subheading is grouped as a strength, weakness, or neutral value within a matrix. Qualities are considered neutral if the answers to the respective question possess qualities of both partial strengths and weaknesses. The matrix organizes strengths and weaknesses visually, so one can easily estimate the Master Plan’s level of efficacy as a general plan.

Chapter VI analyzes sustainability through the application of Scott Campbell’s article, “Green Cities, Growing Cities, Just Cities?: Urban Planning and the Contradictions of Sustainable Development” (1996). The analysis compares the definitions of sustainability within the Coastal Master Plan and within Campbell’s article. Again, using content analysis, the appropriateness of the CPRA’s sustainability definition is contemplated. The balance between social equity, economic development, and environmental protection, or the “planner’s triangle,”

is approximated by categorizing the Master Plan objectives (i.e., social, economic, environmental) as well as the decision criteria/drivers which satisfy those objectives.

The final analysis—public participation—is located in the second section of Chapter VI. For this analysis, authority is placed on Sherry Arnstein’s article, “A Ladder of Citizen Participation” (1969). First, levels of citizen participation are examined, supporting the hypothesis that the public engagement processes amounted to a form of tokenism. To further support the claim, key shortcomings of the participation process were described, followed by “unique” public comments of citizens contained within Appendix G. These comments were submitted by citizens after the release of the draft plan. Unlike spoken comments at public hearings or form letters signed by numerous people, unique comments were individual and unlimited in length.

The public participation analysis required a careful research design strategy. As in “ideal-typical” qualitative methods strategies, the analysis is made up of (1) qualitative data, (2) holistic-inductive design of naturalistic inquiry, and (3) content analysis (Patton 2002:248). Following the themes of qualitative inquiry by Michael Quinn Patton (2002), the data was presented under purposeful sampling:

Cases for study (e.g., people, organizations, communities, cultures, events, critical incidences) are selected because they are “information rich” and illuminative, that is, they offer useful manifestations of the phenomenon of interest; sampling, then, is aimed at insight about that phenomenon, not empirical generalization from a sample population. (Patton 2002:40)

Purposeful sampling made sense in this study, since Appendix G, containing all unique public comments, totaled 774 pages. Additionally, the total number of citizen comments in all forms was estimated at 2,000. Citing each comment as a full sample set would be overwhelming and unhelpful, to say the least. Random sampling would bring forth a variety of generally useful

topics, but would not be useful to explain the particular phenomenon being studied. Therefore, a purposeful sampling of comments was used to illuminate the topic of interest—social equity and participation.

Furthermore, the data collection and fieldwork strategy selected involved qualitative data. Observations, or rather public comments, “yield detailed, thick description.” The data “capture direct quotations about people’s personal perspectives and experiences” (40). The data, while in the form of submitted comments rather than traditional observations of interaction, is naturalistic because the quotations come from people in natural settings (not a laboratory), and comments are open-ended (39). Finally, the analysis strategy, according to Patton, would be categorized as inductive analysis and creative synthesis:

Immersion in the details and specifics of the data to discover important patterns, themes, and interrelationships; begins by exploring, then confirming; guided by analytical principles rather than rules; ends with a creative synthesis. (41)

The validity of the research design strategy—purposeful sampling—has to do with the amount of information contained within each case or opinion. As suggested by Lincoln and Guba (1985), many of the opinions are presented “to the point of redundancy” (Lincoln and Guba 1985:202; cited in Patton 2002:246). In other words, multiple comments by different citizens repeat similar information, and are presented until little new information is forthcoming.

Chapter VII, the final chapter, lists recommendations that will serve to explore the third research question: How could adaptive co-management reform Louisiana’s Coastal Planning process? These recommendations are specific to coastal Louisiana and the Coastal Master Plan, drawing on particular weaknesses of the plan noted in the three analysis sections. The recommendations, or policy alternatives, listed draw upon the literature review of adaptive co-management. The chapter then follows with a discussion and conclusions.

Chapter III

Background

The people of Southern Louisiana have a personal incentive to fight against wetland destruction: the existence of their communities and respective livelihoods are threatened, and time is not on their side. Luckily, coastal communities are not alone in this battle. Local and regional agencies, nongovernmental organizations (NGOs), and state and federal departments form partnerships to mitigate the effects of destructive shoreline practices. In particular, the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) and Louisiana's Coastal Protection and Restoration Authority (CPRA) are currently leading planning powers influencing restoration and protection in the coastal zone. The purpose of this chapter is to introduce the urgent imperative to save Louisiana's precious shoreline, to provide an overview of the initiatives of relevant mitigating agencies, to promote understanding of coastal planning strategies, and to frame the basis of public policy.

America's Coastal Heartland

Nearly half of Louisiana's population calls the coast home for its rich culture, vast beauty, and economic benefits. Residents refer to their coast as a national treasure—America's Coastal Heartland. The loss of such a region would be devastating. Nearly one-third of the Nation's fisheries come from Louisiana's coastal waters (BTNEP 2008). Over 400 bird species visit the region annually, attracting bird enthusiasts from across the nation (LTCC 2012). Louisiana is the leading producer of shrimp, oysters, and crawfish and the second-leading producer of finfish and crabs. One-quarter of U.S. oil and gas is produced or moves through Louisiana's wetlands, fueling the rest of the nation. A large percentage of imported consumer

goods travels through Louisiana's ports. Most of the coffee Americans enjoy passes through the Port of New Orleans. Additionally, the numerous navigation channels and ports make up nearly 20 percent of the U.S. waterborne commerce (BTNEP 2008).

With respect to waterborne commerce, the Gulf Coast economy owes much of its success to the Port of South Louisiana, which stretches 54 miles along the Mississippi River. According to the Army Corps of Engineers, it has ranked first in total tonnage for over a dozen years and is the largest tonnage port in the Western Hemisphere. The Port of South Louisiana along with the Port of New Orleans are two of the top six ranked principle ports by tonnage (USACE 2010a). For South Louisiana, the primary commodities are food (47 percent), petroleum products (23 percent), and crude petroleum (9 percent) (USACE 2010b).

The Gulf Coast Region is home to 78 percent of total U.S. shrimp landings, 62 percent of total U.S. oyster landings, and 16 percent of total U.S. commercial fishery landings. Approximately 1.4 billion pounds of commercial fishery landings come from the Gulf Coast Region annually, amounting to \$660 million in revenue. Of these Gulf Coast statistics, Louisiana provides 71 percent of commercial fishing landings and 43 percent of the commercial fishing value (National Ocean Service, NOAA 2011; National Marine Fisheries Service, NOAA 2010). The Gulf Coast Region also provides the nation with 54 percent of its crude oil, 52 percent of its natural gas, and 47 percent of the crude oil refinery capacity (National Ocean Service, NOAA 2011; Energy Information Administration, Department of Energy 2011).

As a whole, the Gulf of Mexico is the ninth largest water body in the world, and its coast contains half of the wetlands in the United States. As of 2010, the population of the Gulf Coast Region has increased by 10,958,081 residents, or 109 percent, since the 1970s (National Ocean

Service, NOAA 2011; U.S. Census Bureau 2012). The population will continue to grow by an estimated 15 percent by 2020 (National Ocean Service, NOAA 2011; Woods and Poole Economics, Inc. 2010). According to NOAA, 84 percent of the area within Louisiana's parishes which border the Gulf Coast are located within FEMA V-zones, or Special Flood Hazard Areas (SFHAs) (National Ocean Service, NOAA 2011). Furthermore, the U.S. Geological Survey conducts analyses to determine relative vulnerability of coastal areas to sea-level rise-related erosion, flooding, and storm damage. Assessments for the Gulf Coast Region show that 2,105 miles of the shoreline lie within a *very high* vulnerability risk category; this includes the entirety of the Southern Louisiana coast (Thieler and Hammer-Klose 2006).

The Coastal Crisis

The coast of Louisiana is made up of wetlands, a combination of muddy land and sea. The southernmost part of Louisiana was naturally formed from silt deposits which traveled down the Mississippi River. Geologists refer to this as the alluvial or deltaic plain. The high ground of the delta is located along the river channels. When rivers would overflow in the springtime, the waters would carry a full load of soil. The largest sediments build up closest to the channel edges. This process builds up natural levees over time. Southern Louisiana's existence is attributed to the fact that the Mississippi River deposits silt slightly faster than older silt erodes, compresses, or decays (Freudenburg 2009:33-34).

For 7,000 years, the Mississippi river has built the coast of Louisiana. Over millennia, the Mississippi River has shifted, seeking the quickest route to the Gulf of Mexico. As the water flowed, it deposited sediment along channel edges from the northern states, offsetting annual subsidence rates. This natural process built the marshes, wetlands, and barrier islands (BTNEP 2008). The process is now being reversed. The Mississippi Delta has been disappearing as a

direct result of human interference. By creating levees for flood control (the impetus for which occurred after the floods of 1927), humans have locked the river in place, expediting erosion processes (Freudenburg 2009:34).

While the levees held back the silt from reaching Southern Louisiana, old silt deposits continued to compress and erode, reversing the land-building process, and upsetting the natural balance of the estuary system. Levee systems were created to protect communities from inundation and to convey flood waters from upper portions of the Mississippi River to the Gulf of Mexico. These systems were ultimately successful for all intents and purposes; however, the levees inadvertently prevented the naturally-occurring, annual overflows of the Mississippi Delta (BTNEP 2008). Furthermore, the U.S. Geological Survey cites a decline between 70-80 percent in sediment loads reaching Southern Louisiana after the twentieth century due to the construction of levees. As a result, Southern Louisiana has been sinking, which subsequently exacerbates the challenges of flood control (Freudenburg 2009:34).

While levees are the most notable culprits, many other human factors are also to blame for Louisiana's land loss. Climate change attributes rising sea levels to melting glaciers and ice caps in the Arctic. Southern Louisiana, thus, falls below sea level at an even faster rate than ever before. Scientists also argue that rising oceanic temperatures upgrade storms. Hurricane Katrina of 2005, for example, was purportedly upgraded to a hurricane from what would have otherwise remained a tropical storm (Robinson 2005:23). Furthermore, oil exploration and channelization along the Gulf has catalyzed erosion of the natural wetlands. Canals for barge-mounted draglines were dredged to provide transport for drilling barges. Through these canals, salt water has channeled through the wetlands killing salt-intolerant plants and organisms. Among the many victims are the cypress trees, which were once thriving in the marshes. Once the plants die

from water salinity, the root systems no longer exist to hold together the sediment. Over time, the marshes became more fragile, and the canals had to be dredged to combat the ever-increasing silt buildup (Robinson 2005:29). This self-reinforcing cycle, man's attempt to dominate nature, led to the ecological devastation of one of Southern Louisiana's most important ecosystems.

Over 40 percent of the wetlands within the U.S. are located in Louisiana. With an annual loss of 40 square miles of marsh per year, this amounts to 80 percent of the nation's annual wetlands loss. Land loss rates are easily comparable to the area equivalent of a football field every hour (CWPPRA 2012). As the marshes disappear, Louisiana's southernmost parishes lose a natural shield against hurricanes and tropical storms. Vegetated wetlands absorb rain like a sponge, but now they are quickly disappearing (Robinson 2005:29). As land subsides, more of the developed coast is exposed. Without wetlands, barrier islands, and ridglands, levees cannot withhold floodwaters in the event of a serious storm without being raised to higher levels. Unfortunately, humans cannot build them high enough or quickly enough to protect society from the effects of hazardous storm surges. Experts now feel that the solution to the coastal crisis now lies in multiple lines of defense (BTNEP 2008).

The Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA)

Restoration planning in Louisiana's Gulf Coast takes place under multiple agencies, and efforts toward sustainability are touted by many studies and plans. The purpose of this study is to elucidate upon current policy regimes and answer research questions pertaining to the most recent master planning efforts within the State. With this in mind, the framework of two of the most pertinent and influential coastal master planning authorities in Louisiana are examined: CWPPRA and CPRA.

In 1990, the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) was federally legislated to identify, prepare, and fund construction of wetlands restoration and conservation. As of July 2011, 149 CWPPRA coastal restoration projects are active and 91 are completed, benefiting over 112,000 acres of land in Louisiana. The task force credits itself with the total protection of 426,000 acres (CWPPRA 2012). Under the CWPPRA program, projects are evaluated and selected based upon a systematic planning approach. Plans are executed by the Task Force, which is comprised of the State of Louisiana, acting as the local cost-share sponsor, and five federal sponsors:

- (1) U.S. Fish and Wildlife Service (USFWS) of the U.S. Department of the Interior;
- (2) National Resources Conservation Service (NRCS) of the U.S. Department of Agriculture (USDA);
- (3) National Marine Fisheries Service of the Department of Commerce (USDC);
- (4) U.S. Environmental Protection Agency (USEPA); and
- (5) the U.S. Army Corps of Engineers (USACE).

The Task Force provides direction and guidance to subordinate organizations through the Technical Committee. CWPPRA mandates that the Task Force “make final decisions concerning issues, policies, and procedures necessary to execute the Program and its policies” (CWPPRA 2011:10). The federal sponsors of the Task Force have four general responsibilities. First, they “assure that funds spent on a project are spent in accordance with the project’s cost sharing agreement and the CWPPRA.” The agreement currently states that the federal sponsors must provide 85 percent of project funding, and the State (aka local sponsor) must provide a match of 15 percent (CWPPRA 2011:6). Secondly, they “perform any audits of the local sponsor’s credits for the projects as required by the project’s cost-sharing agreement and the

individual agency's regulations." Additionally, "the federal sponsor shall provide the local sponsor with an annual statement of prior State fiscal year expenditures in a format agreeable to the local and federal sponsor by no later than September 30 of each year." Finally, "each quarter, federal sponsors will review funds within each approved project under their purview and determine whether funds may be returned to the Task Force...Funds may be returned to the Task Force by [a] simple deobligation process" (CWPPRA 2011:10).

The title of funds administrator falls upon the U.S. Army Corps of Engineers (USACE), with its central office in New Orleans. USACE general responsibilities include the following:

- (1) to use Corps of Engineers financial accounting procedures;
- (2) to manage the funds for the project;
- (3) to disburse project funds as requested by the Federal Sponsor;
- (4) to regularly report to the agencies and the local sponsor on the status of the project accounts;
- (5) by August 31 of each year, furnish each federal sponsor with a report on project expenditures for the last State fiscal year;
- (6) by the 20th of the month following the end of a fiscal quarter, the Corps of Engineers will prepare and furnish all the agencies and local sponsor a report on the status of funding and cost sharing for each of their projects; and
- (7) to provide program management duties, e.g. PPL reports, minutes of meetings, distribution of planning documents, etc. (CWPPRA 2011:5).

Additionally, the Chairman of the Task Force is the District Commander of the USACE New Orleans District. The Chairman "provides administration, management, and oversight of the

Planning and Construction Programs, and acts as accountant, budgeter, administrator, and disbursing officer of all Federal and non-Federal funds under the Act.” The Chairman also “acts as the official manager of financial data and most information relating to the CWPPRA Program and projects” (CWPPRA 2011:10).

The Technical Committee is an advisory board to the Task Force, and decisions are made in consideration of Technical Committee recommendations. The Task Force charges the Technical Committee “to consider and shape decisions and proposed actions of the [Planning and Evaluation Subcommittee] (P&E), regarding its position on issues, policy, and procedures towards execution of the Program and projects.” The TC “makes directives for action to the P&E, and the TC makes decisions in consideration of P&E recommendations. The responsibilities of the TC include the annual review of the outreach budget and the Public Outreach Committee’s strategic plan” (CWPPRA 2011:11).

The Planning and Evaluation Subcommittee (P&E), established by Technical Committee, is the working level committee made up of special technical workgroups. It is tasked with assisting in “developing policies and processes,” and “recommending procedures for formulating plans and projects to accomplish the goals and mandates of CWPPRA” (CWPPRA 2011:11). Under direction of the P&E are the Environmental Workgroup (EnvWG), Engineering Workgroup (EngWG), and the Economic Workgroup (EcoWG). “EnvWG, under the guidance and direction of the P&E, reviews candidate projects to: (1) suggest any recommended measures and features that should be considered during engineering design for the achievement and/or enhancement of wetland benefits, and (2) determine the estimated annualized wetland benefits (Average Annual Habitat Units) of those projects” (CWPPRA 2011:11). EngWG “provides engineering standards, quality control/assurance, and support for the review and comment for:

engineering, environmental compliance (cultural resources, NEPA, and HTRW), economic, real estate, construction, construction supervision and inspection, project management, operation and maintenance, and monitoring, of candidate and demonstration projects considered for development, selection, and funding under the Act” (CWPPRA 2011:11-12). EcoWG “reviews and evaluates candidate projects that have been completely developed, for the purpose of assigning the fully funded first cost of the projects, based on the estimated 20-year stream of project costs” (CWPPRA 2011:12).

The Priority Project List (PPL) is a list of restoration projects scheduled for implementation. Public participation occurs at the local level as potential projects are being proposed. In Louisiana, each parish has a Coastal Zone Administrator (CZA), who acts as a representative for project proposals within the region. Once the CZAs submit potential restoration projects to CWPPRA, plans are sorted by Regional Planning Teams (RPTs). These teams are made up of staff from federal agencies which represent a particular coastal region. RPTs select very few projects to proceed in the selection process. This could amount to only five to ten projects for each region. Then, selected projects go to the Technical Committee, made up of State and Federal staff members, which selects proposed projects from all RPTs (Peyronnin 2011).

Under CWPPRA, two annual meetings are mandated for the purposes of budgeting. In October, the TF meets to select demonstration projects and candidate projects selected for phase 1 funding from the annual Project Priorities List (PPL). After considering the recommendations of the TC, the TF may approve phase 2 funding in January (CWPPRA 2011:12). During the preliminary assessment of nominated projects, the P&E Subcommittee will prepare a matrix of cost estimates and other pertinent information for nominees and demonstration project nominees.

This information then goes to the TC and the Coastal Protection and Restoration Authority. PPL projects are reviewed by the TC, which considers project costs and potential wetland benefits. Ten are selected for further review by the Environmental, Engineering, and Economic Work Groups. Up to three demonstration projects are also selected for a more detailed assessment (CWPPRA 2011:29-33).

Louisiana's Coastal Protection and Restoration Authority (CPRA)

The 2012 Coastal Master Plan, known formally as Louisiana's Comprehensive Master Plan for a Sustainable Coast, was created by the State agency, Coastal Protection and Restoration Authority (CPRA). Following a critical need as a result of Hurricanes Rita and Katrina, the Louisiana Legislature's First Extraordinary Session of 2005 created the CPRA under Act 8. It directed the state to create a sustainable plan for the entire coast, which was to be updated every five years and was to utilize the science and innovation to the maximum capacity (CPRA 2012a:24).

As in most agencies, CPRA also follows an organizational hierarchy for the purposes of decision-making. The Planning Team, made up of 33 CPRA employees and advisory consultants, was responsible for developing the Master Plan. Other boards, committees, focus groups, and panels advised the Planning Team. The Science and Engineering Board (10 members) was made up of national and international experts who participated in five multi-day meetings and 13 webinars. The Technical Advisory Committees were three to four-member groups tasked with advising the state on how to conduct the analysis in the most technically sound manner. These included committees advising on the best use of the planning tool, modeling, and cultural heritage (10 members total). The Framework Development Team was made up of 33 representatives from business and industry, federal, state, and local governments,

nongovernmental institutions, and coastal institutions. Additionally, three Focus Groups were created: the Navigation Focus Group (18 members), the Oil and Gas Focus Group (8 members), the Fisheries Focus Group (16 members), Predictive Modeling Workgroups (61 members total), the Subsidence Advisory Panel (7 members), and the Marsh Collapse Advisory Panel (6 members).

The first master plan was finalized in 2007. Since then, CPRA has credited itself with having done the following:

- (1) Built or improved 159 miles of levees
- (2) Benefited 19,405 acres of coastal habitat
- (3) Secured approximately \$17 billion in state and federal funding for protection and restoration projects
- (4) Identified and used dozens of different federal, state, local, and private funding sources for projects
- (5) Moved over 150 projects into design and construction
- (6) Constructed projects in 20 parishes
- (7) Constructed 32 miles of barrier islands/berms. (CPRA 2012:25)

In a collaborative effort, CPRA reviewed projects and recommendations from prior studies and plans. The Comprehensive Project List included approximately 1,500 restoration and protection projects. Previously completed plans which contributed to this list included the following:

- (1) 2007 Coastal Master Plan
- (2) A Dutch Perspective on Coastal Louisiana Flood Risk Reduction and Landscape Stabilization

- (3) A Plan to Sustain Coastal Louisiana Using the Multiple Lines of Defense Strategy
- (4) Barataria-Terrebonne National Estuary Program Comprehensive Conservation and Management Plan
- (5) Coast 2050: Toward a Sustainable Coastal Louisiana
- (6) Coastal Impact Assistance Program Tier II Projects
- (7) Coastal Sustainability Studio Concepts
- (8) Coastal Wetland Planning, Protection, and Restoration Act Finalists
- (9) Comprehensive Habitat Management Plan for The Lake Pontchartrain Basin
- (10) Envisioning the Future of the Gulf Coast
- (11) Louisiana Coastal Area Comprehensive Study
- (12) Louisiana Coastal Protection and Restoration Final Technical Report
- (13) Mississippi River Gulf Outlet Ecosystem Restoration Study
- (14) Mississippi River Sediment, Nutrient, and Freshwater Distribution Study
- (15) Parish Master Plans (St. Bernard, Plaquemines, Jefferson, Terrebonne, St. Mary, Vermilion)
- (16) Southwest Coastal Louisiana Feasibility Study
- (17) Third Delta Phase II Reconnaissance Study

The project list was paired down by eliminating duplicate projects, combining small projects into larger projects, removing projects that were not large enough for the Master Plan models to reasonably evaluate, and removing projects that did not include enough specific information to be adequately evaluated using the models (65). In addition to the collaboration with these prior plans and studies, the Master Plan supports CWPPRA projects which are in line

with its objectives and principles. CPRA claims it will not cost share projects that are in conflict with the master plan (167).

CPRA then developed a list of 397 projects for evaluation including restoration projects, structural risk projects, and non-structural risk-reduction projects. The 248 restoration projects can be categorized as barrier island/headland restoration, hydrologic restoration, marsh creation, oyster barrier reefs, ridge restoration, sediment diversion, channel realignment, bank stabilization, and shoreline protection (68-69). Structural protection projects include earthen levees, concrete walls, floodgates, and pumps (70). Nonstructural protection projects include elevation, flood proofing, and voluntary acquisition (72).

Chapter IV

Introduction of the Literature Review

Sustainability of the environment depends upon an equal balance between environmental, social, and economic considerations. Each of these elements is complex in and of itself, compounding the challenges of integration furthermore. In a planning and natural resource management context, governance literature has converged upon a solution with a central focus on collaboration: adaptive co-management. This chapter will first discuss the challenges facing democracy in planning, the ecosystem-based approach, and the evolution of adaptive and collaborative management leading up to the convergence of adaptive co-management. Then, it will focus on the analytical framework of adaptive co-management, overcoming its limitations, and relevant case study outcomes. In doing so, it will explore the first research question: How does adaptive co-management function as a framework for natural resources planning and management?

Science, Democracy, and Ecological Resilience

Postindustrialism ushered in a new era of American democracy, or lack thereof as some critics argue. As opposed to the gossamer reminders of an older regime (i.e. “of the people, by the people, for the people”), the information society now celebrates science and technology as a superior decision-making mechanism (Fischer 2000:10). When “technically trained experts rule by virtue of their specialized knowledge and position in dominant political and economic institutions” (Fischer 1990), technocracy overtakes democracy. While some believe the complexity of our contemporary world has become too great, others remain wary of the pitfalls of reductionist science. For Gunderson (2003), rigid scientific approaches fail when focusing on

the wrong types of uncertainty, erroneously assuming a system near equilibrium, only examining parts of a whole system, or holistically searching for simple structures to explain complexity. Armitage *et al.* (2009:95) further note that efforts to resolve social-ecological dilemmas have erroneously focused on the roles of science, overcoming information gaps, and the construction of models.

The discourse then turns to the integration of science and democracy. Contemporary governance literature advocates for the utilization of expertise to facilitate learning and collaboration in participatory methods. To avoid the dismissal of democracy as a paradigm useful only to past societies, we must understand that expert advice is open to different interpretations, thus, facilitating a “politics of expertise” (Fischer 1990:111).

Despite the historically rising managerial empiricism germane to most policy decisions, the utility of citizen participation has always been a large component of the discourse on social research and engagement. Of vital importance is the foundational understanding that not all participatory methods are equal. In 1969, Sherry Arnstein created a typology of eight levels of participation. Her illustrative diagram, a “ladder of citizen participation,” labels eight rungs in order by extent of citizens’ power: manipulation, therapy, informing, consultation, placation, partnership, delegated power, and citizen control. She further categorized manipulation and therapy as nonparticipation. The middle three rungs consisted of tokenism, and the top three rungs amounted to citizen power (Arnstein 1969). In an increasingly technological world, citizens are more challenged than ever before in contributing meaningful input to complex planning processes. The challenges are compounded further when the planning process is environmental, where the concepts of ecology, geology, and resource management are intricate, technical, and interwoven.

The very complexity of science-based approaches is apparent even in basic conceptualizations of ecological crises. In ecological systems, for instance, resilience can be defined depending upon different aspects of stability (Holling 1973; Gunderson 2003). In the first definition, known as *engineering resilience* (Holling 1996; Gunderson 2003), ecological systems are assumed to exist in a stable steady-state, where resilience is described by a return time to steady state following a perturbation (Pimm 1984; O'Neil *et al.* 1986; Gunderson 2003). The stable-state, while desirable in the face of abrupt change, tends to be less achievable than ever before as a consequence of human actions (Folke *et al.* 2005:442). It is more common for those from traditions of applied mathematics and resource ecology to subscribe to the second definition of *ecological resilience* (Walker *et al.* 1969; Gunderson 2003), where instabilities can flip a system into another stability domain (Holling 1973; Gunderson 2003). Under this classification, resilience is defined as the magnitude of disturbance that can be absorbed before the system redefines its structure by changing the variables and processes that control behavior. The redefinition of structure, or regime change, is thought to be a vulnerability which poses challenges to society (Folke *et al.* 2005:442).

Furthermore, ecological change can be abrupt or gradual. Experiences informing understanding are incomplete, consequences are ambiguous, and future dynamics are unclear. Historically, it has been a rarity in resource management theory to fully acknowledge interactions across scales, instead favoring single issues and steady-state regimes (Folke *et al.* 2005:442). Traditional “command-and-control” regimes, relying on scientific inquiry, fall victim to the limitations of reductionism and disciplinary isolation in a world of surprise and constant change (Levin 1999; Armitage *et al.* 2009). The importance of a more holistic

approach, integrating multiple factors across spatial and temporal scales into the study of ecological systems, is becoming more apparent.

The new express focus of resource managers becomes an ecosystem's capacity to maintain essential ecological processes as opposed to securing maximum sustainable yields. This is commonly known as the *ecosystem-based approach* (Folke *et al.* 2005:443). To Berkes and Folke (2002), it is the management of *social-ecological systems*, a connotation of the human integration in natural systems. Generally accepted is Berkes' conceptualization of social-ecological systems as "complex adaptive systems," noting "issues of scale, uncertainty, non-linear behavior, self-organization, and multiple stability domains" (Berkes *et al.* 2003; Harris 2007; Berkes 2010). To Lee (1993:57), the basic approach is the focus on the bioregion, where "seeing the ecosystem as a whole must precede efforts to manage it" (cited in Huitema *et al.* 2009). Regardless of its name, the goal is the same: a shift in knowledge generation in favor of the whole system.

The Evolution of Adaptive Co-Management

The theoretical foundations of adaptive co-management emerged gradually. Holling first popularized the concept of adaptive management in its capacity for natural resource management in his 1978 publication, *Adaptive Environmental Assessment and Management*. Its legitimacy was again reinforced by Walters' 1986 report, *Adaptive Management of Renewable Resources* (cited in Stankey, Clark, & Bormann 2005). Adaptive management is particularly notable in its capacity for change and reorganization. Under this management paradigm, social capital (i.e., networks, leadership, and trust) and social memory are important sources of resilience (Folke *et al.* 2005:444). The concepts of continuous updates and adjustments to knowledge are foundational, where each action is viewed as an opportunity for learning. Policies become

hypotheses and management actions are experiments (Folke *et al.* 2005:447). For Lee (1993, 1999), institutional prescriptions for adaptive management include collaboration, experimentation, and a bioregional approach (Huitema *et al.* 2009). Within a similar vein, Folke *et al.* (2005) note that the three highly important processes of adaptive governance are participation, collective action, and learning.

Historically, organizational literature on social learning has been extremely relevant to adaptive management. Double feedback loops consider extant assumptions, norms, and objectives of traditional mental models (Armitage *et al.* 2009), and often lead to fundamental changes in behavior (Berkes 2009). In this social learning process, participants monitor outcomes of a particular plan, identify problems, evaluate effectiveness, and provide reflection, leading to the next iteration (Berkes 2009). The literature suggests that the non-linear nature of social-ecological feedback requires horizontal and vertical linkages among social actors in pursuit of social learning (Young 2002; Ostrom 2005; Armitage *et al.* 2009:96). Furthermore, governance literature suggests the legitimacy, accountability, and effectiveness of adaptive management (Folke *et al.* 2005:449).

Co-management entered the natural resource manager's lexicon as a result of case study experiences of the 1980s (Plummer & Armitage 2007; Plummer & Fennell 2007; Berkes 2009). Simply put, it is the joint management of the commons (Carlsson & Berkes 2005). Also termed collaborative management, it can be reduced to a power sharing arrangement between the State and the community. *Collaboration* implies that government bodies work together to manage issues across jurisdictional boundaries and collaborate with non-governmental stakeholders such as citizens and interest groups (Huitema *et al.* 2009). Furthermore, Pinkerton differentiates between two models of co-management, which she refers to as folk-managed systems or state

managed systems. She posits that a horizontal continuum exists, ranging from “nearly total self-management to nearly total state management.” She also notes a “vertical contracting out model of state management” power, a devolution of rights (Pinkerton 1994:322-35; cited in Carlsson & Berkes 2005).

No single formal structure exists, and the process of negotiation, deliberation, and problem-solving is an eternal process. Therefore, *function* rather than form tends to be the focus of co-management literature. Emphasizing this approach, Carlsson and Berkes (2005) explain that power-sharing is actually the result, not the starting point (65). Co-management may be a good approach to organizational development, with its potential for “enhanced equality and efficiency in decision-making, broader based legitimization for actions, and increased capacity at a local scale” (Plummer & Armitage 2007:63).

The marriage of adaptive management and co-management results in a flexible, cooperative form of ecosystem governance, *adaptive co-management*. While adaptive management literature has focused on learning and experimentation, co-management literature has emphasized the sharing of power and responsibility. The literature now converges to the process of adaptive co-management, speaking to the challenges of social-ecological systems management (Olsson, Folke, & Berkes 2004; Armitage *et al.* 2007; Huitema *et al.* 2009).

Processes are collaborative and community-based, with the built-in ability to adapt to change in specific regions—the best of both worlds. Simply put, learning characteristics of adaptive management are merged with collaborative governance. It can best be defined as “a process by which institutional arrangements and ecological knowledge are tested and revised in a dynamic, ongoing self-organized process of trial-and-error” (Folke *et al.* 2002:8). Adaptive co-

management is also described as the “public and private interactions undertaken to resolve societal challenges, and the institutions and principles which mediate those actions” (Kooiman & Bavinck 2005; Armitage *et al.* 2009:95).

Adaptive co-management operates under the subsidiary principle, where effective user participation and problem solving is achieved at the lowest feasible level of organization (Kooiman 2003; Berkes 2010). This is especially true for some developing countries which have experienced devolution. No longer bound by central government, local-level management follows a grassroots, bottom-up planning approach (Berkes 2010).

Like co-management, it is a problem-solving process orchestrated through power-sharing arrangements (Carlsson & Berkes 2005; Folke 2005:448). Adaptive co-management links stakeholders at different levels: local users and municipalities, regional and national organizations, and international bodies. Within these collaborations are often smaller linkages of multiple institutions. The “facilitation by rules and incentives” in combination with the “self-organizing process of adaptive co-management” (Olsson *et al.* 2004a:87), “has the potential to make...social-ecological systems more robust to change” (Armitage *et al.* 2009; cited in Plummer & Armitage 2007).

Analytical Framework

While no single institutional arrangement defines an adaptive co-management regime, contemporary governance literature notes themes, principles, and strategies that contribute to the analytical framework of an adaptive co-management case study. Armitage *et al.* (2009) outline five thematic areas of adaptive co-management: institutions, incentives, and governance; learning through complexity; power asymmetries; assessment; and linking to policy. Similarly

in Berkes' conceptualization, he refers to the "many faces of co-management:" as power sharing, as institution building, as trust and social capital, as process, as problem solving, and as governance (Berkes 2009:1693).

Dietz *et al.* (2003) noted three strategies for successful management of the commons. First is the analytic deliberation among all parties. When key participants are not involved in the institutional design, when there is a lack of trust-building, and a consensus is not reached, co-management will fail (Berkes *et al.* 2007). Second is that "institutional arrangements must be complex, redundant, and nested in layers" (Dietz *et al.* 2003:1910; cited in Berkes *et al.* 2007). This is a key concept for collaborative organizations. Third is that "governance should employ mixtures of institutional types (e.g., hierarchies, markets, and community self-governance)" (Dietz *et al.* 2003:1910; cited in Berkes *et al.* 2007).

Huitema *et al.* (2009) reviewed the literature on institutional prescriptions specific to adaptive water governance. They found that the text is replete with references to *polycentric governance*, where "political authority is dispersed to separately constituted bodies with overlapping jurisdictions that do not stand in hierarchical relationship to each other" (Skelcher 2005:89). Berkes notes that high levels of uncertainty and complexity within social-ecological systems result in difficulty by any one entity to possess the full range of knowledge necessary for environmental governance. Thus, governance research has shifted toward devolution models (i.e., co-management) where knowledge is shared among local, regional, national, and international groups. Polycentric governance reduces vulnerability for three reasons: (1) It has the capacity to deal with issues of multiple geographical scopes at different scales; (2) It has a high degree of overlap and redundancy, where multiple units can take over another's function if

one fails; (3) The use of multiple units provides the capacity for experimentation and group learning (Ostrom 2005:181-182; Huitema *et al.* 2009).

Another institutional prescription is public participation. Governance literature touts the benefits, where participation opens up the decision-making process and makes better use of information and creativity available to society. It also increases public understanding and transparency, and prompts collaboration between government bodies (Huitema *et al.* 2009).

The third institutional prescription, according to Huitema *et al.*, is experimentation. This is a management-based approach where information is hypothetical and management serves as a form of hypothesis-testing. Literature is both positive and critical, bringing to question the results of such learning. Finally, Huitema *et al.* (2009) discuss the focus of the last institutional prescription: the bioregional perspective. The authors note that, in watershed management, the bioregion crosses administrative boundaries, and should be approached at the basin level (i.e., “the river-basin approach,” “the water systems approach,” “integrated water resources management,” or “ICM”). Implicit is the watershed collaborative which must be created among jurisdictions.

Fabricius *et al.* (2007) discovered three types of communities involved in ecosystem management. First are what they called *powerless spectators*, named for their lack of empowerment and capacity, often due to external circumstances out of their control. Second are those with the capacity to respond, but lack of knowledge and institutions for social learning. These are called *coping actors*. Finally there are *adaptive co-managers*:

A third type of community has both the capacity to respond to and deal with change, and possess institutions for social learning. They take a longer term perspective in dealing with threats and their adaptive strategies focus on sustainable development. They frequently collaborate with other groups and constantly invest in their own capacity, and that of the ecosystem to deal with change. (Fabricius *et al.* 2007:5)

Another emerging theme in adaptive co-management literature is the need for the engaging participatory approaches, social learning mechanisms, and adaptive governance networks in adaptive collaborative risk management, a tool for climate change adaptation (May & Plummer 2011).

Inherent in the collaborative nature of adaptive co-management is the acknowledgment that multiple types of sources and knowledge are important (Armitage *et al.* 2009). Much of the present-day literature on social-ecological systems has noted the need for a combination of professional expertise with traditional ecological knowledge (TEK), gathered by indigenous peoples through generations of practice (Folke *et al.* 2005:446). Traditional communities possess fine-grained, contextual ecosystem knowledge through direct experience. This knowledge has evolved through generations of experimentation and trial and error, and can be incorporated into ecosystem management policies and strategies (Fabricius *et al.* 2007). In living with the land, they are the first to notice change in the environment. Berkes further notes that communities are important decision makers in management of the commons because they affect ecosystems at all scales (Berkes 2006).

Minding the recent criticisms of adaptive co-management outcomes, Plummer and Armitage (2007) acknowledge the importance in the incorporation of evaluative frameworks built in to the process. Looking through the lens of resilience, Plummer and Armitage proposed an evaluative framework made up of three components: an ecological component, a livelihoods

component, and a process component. Traditionally, environmental analysis requires both the consideration of natural capital and its function in regulating ecosystem stability as well as its provision of resources for humans (Elkins *et al.* 2003:170; Plummer & Armitage 2007:67). Here, the ecological component of Plummer and Armitage's framework considers the former component of ecosystem function and natural sustainability, where the latter utility as a source and sink for humans is part of the process component. The livelihoods component is used to conceptualize complex economic, social, ecological, and behavioral choices, and is often used to evaluate economics and incentives in the context of co-management outcomes (Plummer & Armitage 2007:68).

Overcoming the Limitations of Adaptive Co-Management

The implementation of adaptive co-management, though successful in numerous applications, is no simple task. Conflict arises where multiple stakeholders have interest in the same pool of resources, and management is internally divided: "Competing interests and values are the norm, and conflict is a frequent operating condition, while social relationships and rules regarding use and management are complex" (Armitage *et al.* 2009:96).

The fundamental adaptive co-management element of participation, according to Brody (2003), faces risks of conflicting interests, slowing down decision-making processes. These contradictions result in "unfortunate compromises between biodiversity conservation and economic development" (cited in Schultz, Duit, & Folke 2010:663). Adaptive governance literature indicates that adaptive co-management serves to assuage internal conflicts among stakeholders and redirects the focus to problem resolution concerning ecosystems. Many authors, however, emphasize the inevitable power struggles and political conflict within environmental decision making. Voß and Bornemann (2011), furthermore, argue that reflexive

governance is overly idealized and sidesteps issues of political conflict: “These ‘nasty politics’ are practically excluded (e.g., by the requirement to leave guns at the door) or sidestepped by an optimistic language that highlights the ‘smooth’ sides of knowledge production and learning.”

Evaluating devolution literature in relation to co-management, Berkes (2010) finds that decentralization experiments often fail to meet objectives: “...the list of objectives has grown far beyond administrative efficiency of delivering services closer to the people, to include participatory development and democratization in general, along with empowerment, poverty reduction, and resource sustainability” (496). Furthermore, Nadasdy (2003) argues that existent inequalities are reinforced when adaptive co-management processes fail to attend to the political economy. Others find that the lack of information on social and economic goals undermines the integrity of community-based natural resource management processes (Kellert *et al.* 2000). Plummer and Armitage (2007) find that critics are often skeptical of the circumvention of regulations and lack of accountability in decision-making processes devolved by the government. Additionally, they cite the “power imbalances and co-option, exclusion of the general public, and perpetuation of narrow interests” (Plummer & Armitage 2007:63).

To contest the many criticisms of participatory action, Schultz, Duit, and Folke (2011) created a quantitative evaluation of adaptive co-management performance from 146 Biosphere Reserves across 55 countries. The features of Biosphere Reserves are very closely linked with those of adaptive co-management: a focus on monitoring, an integrated approach to conservation and development, and recommendations of adaptive management and participation of a sustainable range of actors. Utilizing survey responses of coordinators, directors, and managers of the Biosphere Reserves, and conducting OLS regressions, Schultz, Duit, and Folke found support for a number of hypotheses. Participation of scientists in implementation somewhat

added to perceived credibility of BR implementation. The study also found that high participation levels of local resource users and inhabitants contributed to higher levels of perceived effectiveness of sustainable development goals (666). Overall, the authors concluded that the integration of biodiversity conservation and sustainable development through participation of stakeholders does not have a negative effect on conservation effectiveness; yet, they claim that it is not a panacea for improvement either (668).

Lessons from Case Study Literature

Successful adaptive co-management case studies provide insight into applied mythologies of collaborative social and institutional linkages. Over the past few decades, adaptive co-management arrangements have been appearing, evolving, and gaining attention. Perhaps two of the more prominent case studies today include the Kristianstads Vattenrike of Southern Sweden and the Inuvialuit Region of the Canadian North.

Adaptive co-management emerged in the wetlands ecosystem of Southern Sweden, a Biosphere Reserve, over the span of a decade. The Kristianstad Vattenrike roughly translating to “the Kristianstad Water Realm” (Olsson, Folke, & Hahn 2004:4), includes the *Helgeå River* catchment area and the coastal regions of Hanö Bay within the Municipality of Kristianstad. As a part of the ecosystem management methodology, a new collaborative municipal organization was established in 1989: the Ecomuseum Kristianstads Vattenrike (EKV) (1,6). Interviews of members involved in the EKV indicated that its successful formation depended upon a key individual, or steward (See Table 1) (Pinkerton 1998; Berkes & Folke 2002; Westley 2002; Olsson, Folke, & Hahn 2004). This individual began as an employee of the county museum, but later saw a need for an integration of social actors to manage local resources and fit strategies to match the scale of environmental problems (Olsson *et al.* 2007:5).

For the Kristianstads Vattenrike, traditional conservation plans and policies of the 1980s were not effective. In the lower catchment of the *Helgeå River*, inhabitants cited declining bird populations, eutrophication and overgrowth of lakes, and a decrease in the use of flooded meadows for haymaking and grazing (Olsson, Folke, & Hahn 2004:6). The EKV serves as a facilitator and coordinator in local collaborative processes, involving “international associations, national, regional, and local authorities, researchers, non-profit associations, and landowners to maintain and restore the natural and cultural values of the area” (See Table 1) (Olsson, Folke, & Hahn 2004:7). It reports to the municipality board, but holds no formal authority to make or enforce rules.

According to Olsson, Folke, and Hahn (2004), the transformation of governance involved three distinct phases: preparing the system for change, seizing a window of opportunity, and building social-ecological resilience of the new desired state (See Table 1). As such, the “local policy entrepreneur initiated trust-building dialogue, mobilized social networks with actors across scales, and started processes for coordinating people, information flows and ongoing activities, and for compiling and generating knowledge, understanding, and management policies for ecosystem dynamics” (Olsson, Folke, & Hahn 2004:1). Drawing further upon previous EKV research, Olsson *et al.* (2007) presented two features that link organizations across multiple levels: the role of bridging organizations and the importance of leadership (Olsson *et al.* 2007:1). From the EKV of Southern Sweden, we learn that individual actors can emerge as leaders to facilitate innovative, collaborative arrangements.

Co-management arrangements in Northern Canada paralleled the emergence of Aboriginal land claims agreements. In this case, management boards and joint committees were the institutional structures mandated by such agreements (See Table 1). For example, Article 5,

Part II of the *Nunavut Land Claims Agreements* specifies membership of the Nunavut Wildlife Management Board, the board's bylaws, powers, duties, and responsibilities (Berkes & Fast 2005:10-11). Additionally, Section 14 establishes four co-management institutions, including one for fisheries and marine mammal management, the Fisheries Joint Management Committee (FJMC) (Fast, Mathias, & Banias 2001; cited in Berkes & Fast 2005:11).

Additionally, the *Oceans Act* (Canada 1997) was a direct attempt to utilize co-management arrangements to manage coastal and oceanic resources (See Table 1). This Act was the first of its kind, making Canada the first in the world with comprehensive oceans legislation, with objectives for a) understanding and protecting the marine environment; b) supporting sustainable economic opportunities; and c) international leadership (Canada's Oceans Strategy 2002).

The Inuit of Canada's new Territory of Nunavut particularly harvest Arctic char for subsistence and employment. Partnering with the Department of Fisheries and Oceans (DFO) managers, the Inuit approached co-management informally at first. Later, the *Nunavut Land Claims Agreement* of 1993 legislated co-management within the Nunavut Territory (Kristofferson & Berkes 2005:250). By utilizing local knowledge of the resources, adaptive co-management allows for the traditional management techniques of the Inuit to mix with and enrich the conventional management techniques, based upon scientific methods (See Table 1). Natural resources management scholars Kristofferson and Berkes conclude that legislated adaptive co-management "offers a potentially effective way to manage the Arctic char resource, while simultaneously providing optimum socio-economic benefits to resource users" (266). Undoubtedly, the sheer complexity of Arctic char stock elicits a collaborative approach.

All in all, regions beginning to implement adaptive co-management principles may take note of these exemplary cases. From Southern Sweden and Canada come fundamental lessons. Co-management institutions may come about formally or informally. Organizational authority may be mandated, or boards may hold an advisory capacity. While the structure of co-management institutions may differ among cases, what really matters is function, not form. Key approaches summarized below from the case study literature will influence the analysis of and recommendations for Louisiana’s Coastal Master Plan:

Southern Sweden
<ul style="list-style-type: none"> • Sometimes a key individual or steward can start the process.
<ul style="list-style-type: none"> • The collaborative process can include international associations, national, regional, and local authorities, researchers, non-profit associations, and landowners.
<ul style="list-style-type: none"> • Organizations may not have formal authority, but may report to a higher municipality.
<ul style="list-style-type: none"> • Three phases of transformation are preparing the system for change, seizing a window of opportunity, and building social-ecological resilience of the desired state.

Canada
<ul style="list-style-type: none"> • Management boards, committees, and other co-management institutions can be mandated by land claims agreements.
<ul style="list-style-type: none"> • Federal legislation (i.e., Canada's <i>Oceans Act</i>) can utilize co-management arrangements to manage coastal and oceanic resources.
<ul style="list-style-type: none"> • Co-management arrangements including indigenous peoples allow for the mixture of traditional and conventional management practices.

Table 1. Key findings of leading adaptive co-management case studies.

Sources:

Southern Sweden: Pinkerton 1998; Berkes & Folke 2002; Westley 2002; Olsson, Folke, & Hahn 2004; Olsson *et al.* 2007

Canada: Fast, Mathias, & Baniias 2001; Canada’s Ocean Strategy 2002; Berkes & Fast 2005; Kristofferson & Berkes 2005

Chapter V

Analysis of the Plan Critique

The introduction of the Louisiana 2012 Coastal Master Plan, for the purposes of content analysis, is of extreme importance. The introduction quickly gives its readers an idea of the most valuable qualities of the coast and the state's topmost priorities in the eyes of the planners. The Comprehensive Coastal Master Plan of 2012 is an update to the version compiled in 2007. Since 2008, the Master Plan credits itself with progress, including 159 miles of built or improved levees, 19,405 acres of coastal habitats benefited, and \$17 billion in State and Federal funding for protection and restoration (CPRA 2012a:22). From its introductory paragraphs, the plan subtly reveals a predisposition toward certain restoration priorities:

We developed the plan by taking a look 50 years into south Louisiana's future and building world class science and engineering expertise into understanding what we can achieve...Since the 2007 Master Plan was released, we have built more levees, restored more land, and invested more dollars than anytime in the state's history. (28)

Here, we notice that a great amount of authority is placed on physical science to make restoration decisions. Additionally, we see that value is placed on the number of levees constructed, land restored, and dollars spent. These components are easily visible to the public; they are quantitative building blocks representing elements of progress. To satisfy a quantitative approach, the plan assumed a moderate scenario of future coastal conditions and cited a \$5.3 billion decrease in expected annual damages over 50 years if the plan is implemented.

As described in the methodology, the plan evaluation follows the suggested general criteria for plan assessment of William C. Baer's article, "General Plan Evaluation Criteria: An

Approach to Making Better Plans” (2007). Baer’s evaluation criteria, as presented in Figure 1, assess professional expertise, including the plan as a document communicating methodology, reasoning, and content (Baer 2007:337). Part of his philosophy to judge plan competency is to guard against serious errors and omissions, and to set down criteria for a *bad* plan in order to determine criteria for a *good* plan. He also gives credence to professionally approved standards. These are exemplified by the set of criteria in California’s *Planning Law Analysis and Test Organizer* (PLATO) (Governor’s Office of Planning and Research 1990b) and the *State of California General Guidelines* (Governor’s Office of Planning and Research 1990a). Additionally, Baer accounts for changing legal expectations, leading to mandates for better documentation of a plan’s purpose. The claim that a plan is in the public’s best interest must be backed by evidence (Baer 2007:337).

The purpose of this analysis is to set up a standardized framework for general evaluation before considering the plan in light of sustainability theory. Results of the general plan critique are embedded within the evaluation section of each general criterion in the following pages. In doing so, the critique explores the first research question: What are the strengths and weaknesses of the 2012 Coastal Master Plan and its policy framework?

Adequacy of Context. *(Explain the context and setting: the what and the why of the document. They are not self-evident to the public.)*

1. Is the political/legal context of the plan explained (e.g., meeting state mandates, public discussion and consideration, top priority issues)?
2. Is the administrative authority for preparation indicated (Council or Planning Commission resolution, state law, federal requirement, etc.)?
3. Is the role of the preparing agency or firm adequately explained (e.g., a letter of transmittal)?
4. Is background information presented (e.g., reasons for plan's presentation)?
5. Is it clear who the plan is for (e.g., citizens, agency head, city council, board)?
6. Is the purpose of the plan explained (e.g., study, information, decision, action, conveyance of advice)?
7. Is the type of plan and its scope reported early on, to alert the reader about what to expect? (E.g., the reader is alerted that this plan is highly quantitative and analytic; far ranging or narrow; specific, and technical.)
8. Is an overview/summary provided (e.g., an "Executive Summary")?
9. Is the source of funding for the plan shown (e.g., federal, state, local, private donor, agency)?
10. Is the amount of time in preparation shown (total person/hrs., weeks, etc.)?

"Rational Model" Considerations. *(Show basic planning considerations based on underlying theory and its criteria. Even beyond the list here, there are many theories and types of plans. The plan authors must be clear themselves about what they are doing, to transmit clarity to the reader.)*

1. Given the type of plan to be prepared, are the plan formulators clear about the criteria they will use to assess its progress while being formulated?
2. Have these criteria been made explicit in the plan?
3. Are problems specifically identified (or only implied)?
4. Are goals and objectives explicitly identified?
5. Is the tone of the plan commensurate with the planning approach recommended (e.g., comprehensive, incremental, advocacy, etc.)?
 - a) If the plan is intended to be comprehensive, does it relate substantively to a larger whole (e.g., horizontal relation to other agencies and adjacent governing bodies)?
 - b) Does the plan consider the regional or next higher level of government or context (e.g., vertical relation)?
 - c) Is there planning for procedural coordination with other plans and agencies?
6. Is the capacity or adequacy of existing infrastructure and organizational systems described?
7. Are alternatives listed, or at least considered?
8. Are the alternatives identified as "variations on a theme," or as radically different?
9. Are tradeoffs permitted?

Procedural Validity. *(Explain the who and the how of the plan-making; inform the reader about what went on in making the plan and what is going on by publishing it.)*

1. Who was involved in the plan formulation (e.g., staff from different agencies or departments, citizen groups, politicians)?
2. How were they chosen (e.g., on the basis of expertise, interest, volunteering, or other self-selection)?
3. How were they involved (e.g., discussion groups, internal staff memos or papers, public meetings)?
4. How were data, models, goals, and other pertinent information used in recommending policy or action?
5. How were technical matters transformed into recommended policy (e.g., through "ordinary knowledge," experience, "scientific" training, design training)?
6. Was an advisory group used?
7. Were preliminary drafts circulated for public comment?

Adequacy of Scope. *(Show how the plan is connected to the larger world.)*

1. Have all possible or pertinent issues been considered (e.g., physical, social, economic, political, psychological, cultural, or design)?
2. Have issues of efficiency and equity and predictability been considered?
3. Has the distribution of costs and benefits among different groups and interests been considered?
4. Have relocation/displacement implications been considered?
5. Have financial/fiscal implications been considered?
6. Have the legal implications been considered?
7. Has feasibility in the larger political context been considered?

Guidance for Implementation. *(Most plans are intended to do something. Consider the instruments [ordinances, regulations, budgets, schedules, etc.] and the agencies and persons responsible for making the plan work. Should they be included? [A vision plan would not have an implementation aspect; rather, it would have a section dealing with "the next steps."])*

1. Are implementation provisions appropriate in the plan?
2. Are there priorities for implementation?
3. Is cost of implementation vs. nonimplementation considered?
4. Is there a time span for plan implementation?
5. Is there provision for scheduling and coordinating of implementation proposals?
6. Can proposals accomplish their intended purpose if implemented?
7. Is there a program or proposal for an impact analysis?
8. Is the agency or person responsible for implementation identified?
9. Can the responsible agency realistically be expected to implement the plan?

Figure 1. Baer's suggested general criteria for plan assessment (Baer 2007).

Approach, Data, and Methodology. *(Make clear the technical bases, if any, of the plan; where the data come from and how they are used, so that others may check the plan's thinking by use of the same sources.)*

1. Is the plan based on a wide spectrum of data where feasible?
2. Is the plan sufficiently flexible to permit new data and findings to be fed in?
3. Are the data sources cited?
4. Are the methodology sources cited?
5. Are the levels of data aggregation relevant or meaningful to the study?

Quality of Communication. *(Clear communication above all else is necessary for a fair hearing from others.)*

1. Is the client or reading public identified (e.g., public at large, other professionals)?
2. Are the ideas convincingly presented, given the nature of the audience?
3. Are the rationales behind the decisions effectively presented?
4. Are the proposals/recommendations/conclusions consistent with objectives?

5. Is the tone of the document consistent with the message conveyed (e.g., not presented in the past tense as an accomplished fact when the plan is for study and review)?
6. Are the criteria indicated by which the plan is intended to be judged?

Plan Format. *(Other forms of communication are found in the plan format itself, as well as evidence on who takes professional responsibility for the plan's formulation, when it was adopted, and other seemingly incidental concerns that nevertheless communicate professional competence.)*

1. Are the size and format conducive to the use intended? (For example, an oversize plan is hard to file and copy, hence does not lend itself to constant reference and day-to-day use.)
2. Is the date of publication shown?
3. Are the authors shown, to indicate professional responsibility (names of personnel who worked on the plan, as well as agency or firm names)?
4. Is there a table of contents?
5. Are pages numbered?
6. Are graphics used to best advantage?
7. Is the plan attractively laid out?

Figure 1 continued

Plan Evaluation

1) Adequacy of Context. (*Explain the context and setting: the what and the why of the document. They are not self-evident to the public.*)

- a. Is the political/legal context of the plan explained (e.g., meeting state mandates, public discussion and consideration, top priority issues)?

Evaluation: On page 24, the plan describes the formation of the CPRA by the Louisiana Legislature during the First Extraordinary Session of 2005. It also describes CPRA's direction to develop a plan for a safe and sustainable coast. Top priority issues include land loss and flood risk. Mention of specific public discussion is scant within the plan.

- b. Is the administrative authority for preparation indicated (Council or Planning Commission resolution, state law, federal requirement, etc.)?

Evaluation: The administrative authority is the Coastal Protection and Restoration Authority.

- c. Is the role of the preparing agency or firm adequately explained (e.g. a letter of transmittal)?

Evaluation: The plan acknowledges the citizens, legislators, parish representatives, and stakeholder groups who attended meetings. It explains how public comments affected final decisions for certain projects (110-113). To an extent, it does explain the role of the Framework Development Team; Fisheries, Oil and Gas, and Navigation Focus Groups; Science and Engineering Board; Technical Advisory Committees; Predictive Modeling Workgroup; Subsidence Advisory Panel; and Marsh Collapse Advisory Panel. It does not specifically address how advice from each panel was implemented for particular projects.

- d. Is the background information presented (e.g. reasons for plan presentation)?

Evaluation: The introduction (13-40) provides background information about the coastal crisis. Here, the problem is defined. Chapter I (41-62) prefaces the guidelines of the master plan.

- e. Is it clear who the plan is for (e.g. citizens, agency head, city council, board)?

Evaluation: The plan explains itself as one created by the CPRA, and to be passed by the Louisiana Legislature for the benefit of the State, including its citizens and agencies.

- f. Is the purpose of the plan explained (e.g. study, information, decision, action, conveyance of advice)?

Evaluation: The purpose is to create a plan of action for the next 50 years.

- g. Is the type of plan and its scope reported early on, to alert the reader about what to expect (e.g. the reader is alerted that this plan is highly quantitative and analytic; far ranging or narrow; specific, and technical.)?

Evaluation: Within the introduction, readers are told that the legislature directed the CPRA to “take maximum advantage of new science and innovation” (24). The plan, however, is not overly technical. Much of the plan is reported in a quantitative, analytic manner, though most scientific data is not included in the body of the plan. Much of this information is located within the appendices, which are contained in individual documents and must be obtained separately.

- h. Is an overview/summary provided (e.g. federal, state, local, private donor, agency)?

Evaluation: The plan is summarized in the conclusion.

- i. Is the amount of time in preparation shown (total person/hrs. weeks, etc.)?

Evaluation: This information can be found within the meeting summaries within the appendices.

2) “Rational Model” Considerations (*Show basic planning considerations based on underlying theory and its criteria. Even beyond the list here, there are many theories and types of plans. The plan authors must be clear themselves about what they are doing to transmit clarity to the reader.*)

- a. Given the type of plan to be prepared, are the plan formulators clear about the criteria they will use to assess its program while being formulated?

Evaluation: The decision criteria is listed on pages 56-57: support of cultural heritage, distribution of flood risk reduction across socioeconomic groups, flood protection of historic properties, flood protection of strategic assets, support of navigation, support of oil and gas, use of natural processes, operations and maintenance, and sustainability. While the plan is entitled, “Louisiana’s Comprehensive Master Plan for a *Sustainable Coast*,” sustainability is listed last of all other decision criteria. The explanation reads, “This criterion puts a higher value on restoration projects that keep building or sustaining land 40 to 50 years after they are built” (57). It does not mention a balance between environmental, economic, and social interests. Additionally, the plan does not explain how decision criteria are prioritized.

- b. Have these criteria been explicit in the plan?

Evaluation: Each decision criterion is listed within Chapter I.

- c. Are problems specifically identified (or only implied)?

Evaluation: Problems related to land loss and ecological change are thoroughly addressed in the introduction (13-39). The plan also approaches particular economic threats in this section. The plan does not address cultural or sociological concerns.

- d. Are goals and objectives explicitly identified?

Evaluation: The mission statement includes intentions for a comprehensive scope, broad based collaboration, and providing for future generations. Overall goals are protection and restoration (30). Master plan objectives involve flood protection, natural processes, coastal habitats, cultural heritage, working coast (43). The plan, however, does not explicitly set forth connections between goals, objectives, and policy implications. Guidelines for the Master Plan should be connected to policies discussed at the end of the plan so that readers may understand how projects and policies will satisfy goals and objectives.

e. Is the tone of the plan commensurate with the planning approach recommended (e.g., comprehensive, incremental, advocacy, etc.)?

i. If the plan is intended to be comprehensive, does it relate substantively to a larger whole (e.g., horizontal relation to other agencies and adjacent governing bodies)?

Evaluation: The plan is meant to be *comprehensive*, a word often used interchangeably with *master* (plan). In a regional sense, the plan focuses on Louisiana's entire coast in terms of land loss and flood protection. The plan, however, is not comprehensive because it does not comprehensively address all coastal issues. For example, the plan does not incorporate land use or development plans of coastal communities, which could have serious implications for the future of the coast as a whole.

ii. Does the plan consider the regional or next higher level of government or context (e.g. vertical relation)?

Evaluation: Yes. The plan was produced by a state agency, CPRA, which received a mandate from the Louisiana Legislature. CPRA mentions the directives of the State.

- iii. Is there planning for procedural coordination with other plans and agencies?

Evaluation: The master plan approach is similar to that of the Coastal Wetlands Planning, Protection, and Restoration Act Program. The Master Plan supports CWPPRA projects that are in line with its objectives and principles, and will not cost share projects that are in conflict with the master plan (167). Additionally, the master plan claims to coordinate with at least 17 prior studies and plans for the coast (65). It was unable to incorporate all projects and initiatives of these other plans. Research and modeling used for the Master Plan was undertaken separately by participating scientists, and the procedure used in this plan differs from the others. Coordination among plans appears superficial.

- b. Is the capacity or adequacy of existing infrastructure and organizational systems described?

Evaluation: Yes. This is done by modeling the expected annual damages from flooding and potential annual land change over the next 50 years, among other models, for the *Future without Action* versus the *Master Plan* as proposed.

- c. Are alternatives listed, or at least considered?

Evaluation: The plan does not list alternatives other than the future without action. Alternatives or individual projects not selected for the plan are not discussed.

- d. Are the alternatives identified as “variations on a theme,” or as radically different?

Evaluation: The plan does not list alternatives. Only selected projects are listed.

- e. Are tradeoffs permitted?

Evaluation: Tradeoffs are not permitted.

3) Procedural Validity (*Explain the who and the how of the plan-making; inform the reader about what went on in making the plan and what is going on by publishing it.*)

- a. Who was involved in the plan formulation (e.g. staff from different agencies or departments, citizen groups, politicians)?

Evaluation: Participation in the plan included the Planning Team (33 CPRA employees and consultants), the Science and Engineering Board (10 members), Technical Advisory Committees (10 members), the Framework Development Team (33 representatives), the Navigation Focus Group (18 members), the Oil and Gas Focus Group (8 members), and the Fisheries Focus Group (15 members), twelve Predictive Modeling Workgroups (61 members total), the Subsidence Advisory Panel (7 members), and the Marsh Collapse Advisory Panel (6 members). The plan also claims that 1,350 people attended regional community meetings and public hearings (48). The plan furthermore lists groups consulted (49).

- b. How were they chosen (e.g. on the basis of expertise, interest, volunteering, or other self-selection)?

Evaluation: Committee, board, panel, and focus group members were chosen based upon professional interest and/or scientific expertise.

- c. How were they involved (e.g. discussion groups, internal staff memos or papers, public meetings)?

Evaluation: The public was invited to ten community meetings between July and September 2011 and three public hearings held in early January 2012. Committees, boards, advisory panels, and focus groups met throughout the planning process. These meetings were not open to the public.

- d. How were data, models, goals, and other pertinent information used in recommending policy or action?

Evaluation: Biophysical data informs models, which are used to recommend policy and action. Objectives, which involve flood protection, natural processes, coastal habitats, cultural heritage, and a working coast, are used to justify the plan.

- e. How were technical matters transformed into recommended policy (e.g., through ordinary knowledge, experience, scientific training, design training)?

Evaluation: Technical models, built by biophysical scientists, are used to inform policy. Details from these models are stored in the appendices. Within the body, data is oversimplified, and the explanation may come across as condescending: “Underneath the complex graphs and tables is a simple purpose—to combat the catastrophe engulfing our state and create a secure future for our citizens. When all is said and done, that is what the master plan is all about” (38). The message asks for a reader’s trust because non-experts are not sophisticated enough to understand the process. Traditional ecological knowledge of local residents is not utilized.

- f. Was an advisory group used?

Evaluation: The Framework Development Team; Fisheries, Oil and Gas, and Navigation Focus Groups; Science and Engineering Board; Technical Advisory Committees; Predictive Modeling Workgroup; Subsidence Advisory Panel; and Marsh Collapse Advisory Panel all held advisory capacities.

- g. Were preliminary drafts circulated for public comment?

Evaluation: The draft was released in January 2012, and was downloadable online. The CPRA then held three public meetings in New Orleans (January 23), Houma (January 24), and Lake Charles (January 25). Public comments were accepted through February 25, 2012.

4) Adequacy of Scope (*Show how the plan is connected to the larger world.*)

- a) Have all possible or pertinent issues been considered (e.g., physical, social, economic, political, psychological, cultural, or design)?

Evaluation: The plan claims to have considered all pertinent issues, but it does not actually consider pertinent social and cultural issues. Of all advisory groups, only three social scientists participated on the Cultural Heritage Technical Advisory Committee. The plan does not consider unique issues faced by Native American Tribes or other local populations.

- b) Have issues of efficacy *and* equity *and* predictability been considered?

Evaluation: Issues of social equity are not considered, though they seem to be implied. The planning approach is predominantly environmental/biophysical and marginally economic. Social science is severely lacking within this plan.

- c) Has the distribution of costs and benefits among different groups and interests been considered?

Evaluation: Costs and benefits are significant driving forces within the plan. Project descriptions and costs for first and second implementation periods are listed by region within Chapter V (115-163).

- d) Have relocation/displacement implications been considered?

Evaluation: Relocation/displacement implications are not addressed. Concerns were raised in public hearing and submitted public comments, but the finalized plan does not mention any changes made on behalf of these concerns.

e) Have the legal implications been considered?

Evaluation: Policy and legal aspects are discussed near the end of the document (173-176). Topics covered include the Gulf Coast Ecosystem Restoration Task Force, the Deepwater Horizon Oil Spill, mitigation policy, Congressional and legislative actions, sound management of limited resources in the coastal zone, and the Freshwater Management Plan.

f) Has feasibility in the larger political context been considered?

Evaluation: Neither local and regional politics, nor their implications are discussed in depth within the master plan.

5) Guidance for Implementation (*Most plans are intended to do something. Consider the instruments [ordinances, regulations, budgets, schedules, etc.] and the agencies and persons responsible for making the plan work. Should they be included? [A vision plan would not have an implementation aspect; rather, it would have a section dealing with “the next steps.”]*)

a. Are implementation provisions appropriate in the plan?

Evaluation: Yes. The plan prioritizes plans for implementation by phase and region. Implementation is dependent upon funding.

b. Are there priorities for implementation?

Evaluation: Yes. Projects are organized by implementation period. Cost plays a role in prioritization. The plan claims that a new aspect of the 2012 Master Plan is the “use of innovative tools to identify the best projects and the most effective use of dollars” (42).

- c. Is cost of implementation vs. nonimplementation considered?

Evaluation: Cost of implementation is listed by project in the tables of Chapter V. Cost of nonimplementation is considered within the plan in the “future without action” scenario. For example, in a moderate scenario, the plan estimates a \$5.3 billion decrease in expected annual damages from flooding at year 50 if the master plan is implemented. It estimates an \$18 billion decrease in a less optimistic scenario (28).

- d. Is there a time span for plan implementation?

Evaluation: The master plan looks 50 years into the future and will be updated every 5 years.

- e. Is there provision for scheduling and coordinating of implementation proposals?

Evaluation: Each project is separated into the first implementation period (2012-2031) to the second implementation period (2032-2061). Not every project is guaranteed to be approved for the second implementation period.

- f. Can proposals accomplish their intended purpose if implemented?

Evaluation: Models show that projects are likely to succeed as flood control and land building mechanisms if implemented properly. The likelihood to achieve economic and social objectives is unknown.

- g. Is there a program or proposal for an impact analysis?

Evaluation: Included are evaluations of environmental factors including sea level rise, subsidence, storm frequency, river discharge/sediment load, river nutrient concentration, rainfall, evapotranspiration, and marsh collapse threshold.

- h. Is the agency or person responsible for implementation identified?

Evaluation: Yes. The CPRA is responsible for implementation, though particular contractors are not listed in the body of the main document.

- i. Can the responsible agency realistically be expected to implement the plan?

Evaluation: Yes. CPRA created its first master plan in 2007 and continues to implement projects.

6) Approach, Data, and Methodology (*Make clear the technical bases, if any, of the plan; where the data come from and how they are used, so that others may check the plan's thinking by use of the same sources.*)

- a. Is the plan based on a wide spectrum of data where feasible?

Evaluation: The plan is based upon a wide spectrum of biophysical data, but is limited in its capacity to deal with economic and social data as a result of its focus and priorities.

- b. Is the plan sufficiently flexible to permit new data and findings to be fed in?

Evaluation: The plan incorporated adaptive management principles, which allows for adjustments in the face of change. The plan is updated every 5 years, so new data may have an effect on future decisions.

- c. Are the data sources cited?

Evaluation: Data sources are often not cited properly. Rationale is not credited to particular boards. Photographs were used without permission or photo credit. Photographs of local minority groups were often used, giving the appearance of a high level of citizen collaboration, though these groups tend to feel otherwise.

- d. Are the methodology sources cited?

Evaluation: Methods are somewhat explained, though the roles of particular advisory groups are unclear.

- e. Are the levels of data aggregation relevant or meaningful to the study?

Evaluation: Levels of data aggregation appear to be very meaningful to the study.

7) Quality of Communication (*Clear communication above all else is necessary for fair hearing from others.*)

- a. Is the client or reading public identified (e.g., public at large, other professionals)?

Evaluation: The body of the master plan is directed toward the public, which is made clear early in the document.

- b. Are the ideas convincingly presented, given the nature of the audience?

Evaluation: The ideas are convincingly presented, though the general public has little opportunity to check its validity given the scientific approach. Local and traditional ecological knowledge is not considered, so much of the local expertise is excluded.

- c. Are the rationales behind the decisions effectively presented?

Evaluation: The rationales for individual projects are based upon science. Any other rationale playing a role in particular projects is not included in the text. As a whole, the master plan describes its rationale within decision criteria.

- d. Are the proposals/recommendations/conclusions consistent with objectives?

Evaluation: For the most part, project proposals are consistent with objectives; however, the objective to sustain the unique cultural heritage is vague and its connection to individual projects is undefined.

- e. Is the tone of the document consistent with the message conveyed (e.g., not presented in the past tense as an accomplished fact when the plan is for study and review)?

Evaluation: Yes. The plan is targeted for the next 50 years and is conveyed as such.

- f. Are the criteria indicated by which the plan is intended to be judged?

Evaluation: The decision criteria are used to justify the plan, but the decision drivers seem to be more apt as tools to judge the plan. Two questions represent the plan's decision drivers: 1) How well did the projects reduce flood risk; 2) How well did the projects build new land or sustain the land we already have? If these two questions are answered in the affirmative after project implementation, the CPRA most likely will consider a project successful.

8) Plan Format (*Other forms of communication are found in the plan format itself, as well as evidence on who takes professional responsibility for the plan's formulation, when it was adopted, and other seemingly incidental concerns that nevertheless communicate professional competence.*)

- a. Are the size and format conducive to the use intended? (For example, an oversize plan is hard to file and copy, hence does not lend itself to constant reference and day-to-day use.)

Evaluation: The plan is formatted to be used as a standard document, which can be printed by an average citizen.

- b. Is the date of publication shown?

Evaluation: The publication date is not on the cover or title page. The body of the text states that the plan was submitted in 2012.

- c. Are the authors shown, to indicate professional responsibility (names of personnel who worked on the plan, as well as agency or firm names)?

Evaluation: Yes. CRPA members are listed first, followed by the acknowledgment of advisory groups.

- d. Is there a table of contents?

Evaluation: Yes.

- e. Are pages numbered?

Evaluation: Yes.

- f. Are graphics used to best advantage?

Evaluation: Graphics are well-utilized, though credit is not listed below. In some cases, photos of citizens are used without permission.

g. Is the plan attractively laid out?

Evaluation: Yes. The layout is attractive and easy to read.

Evaluation Criteria	Question	Strength	Neutral	Weakness
(1) Adequacy of Context Strength overall	a.	•		
	b.	•		
	c.		•	
	d.	•		
	e.	•		
	f.	•		
	g.			•
	h.	•		
	i.		•	
(2) "Rational Model" Considerations Weakness overall	a.			•
	b.		•	
	c.		•	
	d.		•	
	e.i.			•
	e.ii.	•		
	e.iii.		•	
	f.	•		
	g.			•
	h.			•
	i.			•
(3) Procedural Validity Neutral overall	a.	•		
	b.		•	
	c.			•
	d.		•	
	e.			•
	f.	•		
	g.	•		

Table 2. Results matrix of Louisiana's 2012 coastal master plan (adapted from Baer 2007).

Evaluation Criteria	Question	Strength	Neutral	Weakness
(4) Adequacy of Scope Weakness overall	a.			•
	b.			•
	c.	•		
	d.			•
	e.	•		
	f.			•
(5) Guidance for Implementation Strength overall	a.	•		
	b.	•		
	c.	•		
	d.	•		
	e.		•	
	f.		•	
	g.	•		
	h.	•		
	i.	•		
(6) Approach, Data, and Methodology Neutral overall	a.		•	
	b.	•		
	c.			•
	d.		•	
	e.	•		
(7) Quality of Communication Strength overall	a.	•		
	b.		•	
	c.	•		
	d.		•	
	e.	•		
	f.		•	
(8) Plan Format Strength overall	a.	•		
	b.			•
	c.	•		
	d.	•		
	e.	•		
	f.	•		
	g.	•		

Table 2 continued

Overall Assessment of Results

After reviewing Baer's criteria in Figure 1, followed by Louisiana's Coastal Master Plan results in Table 2, note that questions oriented toward social equity and public participation are embedded within particular standards as opposed to others. For instance, (2) "Rational Model" Considerations, (3) Procedural Validity, and (4) Adequacy of Scope are backed by questions about considerations for the reader, involvement in the planning process, and how the plan is connected to the larger world. Other criteria are more procedural or perfunctory. For example, (1) Adequacy of Context evaluates whether the document provides a proper background for the plan being created; while, (8) Plan Format assesses the layout and readability of the document itself. Each criterion is vital in its own right, to achieve at least a marginally successful master plan.

In Table 2, the evaluation results for Louisiana's 2012 Coastal Master Plan are listed as strengths, weaknesses, or neutral assessments depending upon the written evaluation of each question. Most evaluation criteria suggested overall strengths. These include (1) Adequacy of Context, (5) Guidance for Implementation, (7) Quality of Communication, and (8) Plan Format. Two were largely neutral: (3) Procedural Validity and (6) Approach, Data, and Methodology. Two criteria suggested overall plan weaknesses: (2) "Rational Model" Considerations and (4) Adequacy of Scope. One neutral criterion (procedural validity) and both criteria listed as weaknesses ("rational model" considerations and adequacy of scope) contain social equity concerns.

Baer's evaluation criteria assures for the representation of professional planning standards, while also guarding against omissions. This assessment is the first cut at the integration of planning theory for comprehensive, sustainable plans. The plan critique, under

these standards, reflects a weakness in social engagement within the planning process. From this assessment, the analysis will delve into further detail on the need for a more active level of citizen power. Furthermore, this evaluation will proceed by defining sustainability and evaluating perceptions of public participation.

Chapter VI

Analysis of Adaptive Co-Management: Sustainability

Perhaps the most currently pervasive conceptualization of sustainability can be traced back to the World Commission on Environment and Development, also known as the Brundtland Commission. Holistically thinking, development is sustainable if it “meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED 1987). Other definitions, while also holistic, are more concerned with integrating human and environmental considerations: “[The] sustainable society is one that lives within the self-perpetuating limits of its environment” (Coomer 1979; cited in Faber *et al.* 2005:3).

Redefining Sustainability: Campbell’s “Planner’s Triangle

For planning professionals, sustainability became more broadly defined in 1996. University of Michigan Professor Scott Campbell published the article, “Green Cities, Growing Cities, Just Cities?: Urban Planning and the Contradictions of Sustainable Development” in the *Journal of the American Planning Association*. In his article, Campbell explores the need for consideration of the interplay between environmental protection, economic development, and social equity concerns:

Nothing inherent in the discipline steers planners either toward environmental protection or toward economic development—or toward a third goal of planning: social equity. Instead, planners work within the tension generated among these three fundamental aims, which, collectively, I call the “planner’s triangle,” with sustainable development located at its center. This center cannot be reached directly, but only approximately and indirectly, through a sustained period of confronting and resolving the triangle’s conflicts. (Campbell 1996:296)

Campbell further identifies three conflicts, as presented in Figure 2, located along the axes of the planner’s triangle: the property conflict, the resource conflict, and the development

conflict. The property conflict is settled between economic growth and equity. It “arises from competing claims on and uses of property, such as between management and labor, landlords and tenants, or gentrifying professionals and long-time residents” (298). This growth-equity conflict is further complicated because each side not only resists the other, but also needs the other for its own survival. The resource conflict comes between economic development and environmental protection. “Business resists the regulation of its exploitation of nature, but at the same time needs regulation to conserve those resources for present and future demands” (299). The development conflict is a challenge between social equity and environmental preservation. Campbell elucidates further:

If the property conflict is characterized by the economy's ambivalent interest in providing at least a subsistence existence for working people, and the resource conflict by the economy's ambivalent interest in providing sustainable conditions for the natural environment, the development conflict stems from the difficulty of doing both at once.” This may be the most confounding and challenging conundrum of all. (299)

In coastal Louisiana, the property conflict is a tension between the needs of people to live and work on land within a hazard-prone locale; whereas, the resource conflict can be conceptualized by the clash between local and corporate industries, including oil, gas, navigation, and fisheries, and wellbeing of social-ecological systems. The development conflict, therefore, is the complexity in ensuring environmental justice for the people of the coast, while sustaining necessary economic interests.

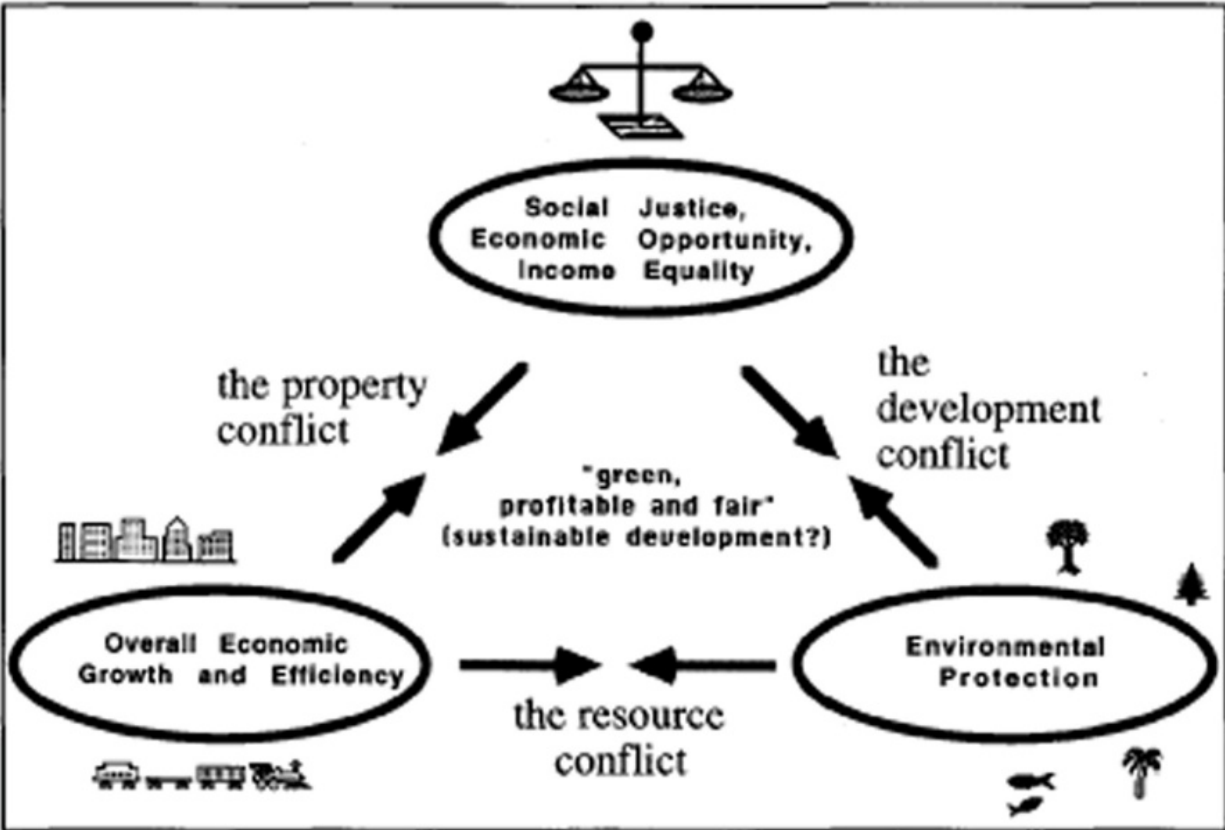


Figure 2. Campbell's "Planner's Triangle" (Campbell 1996)

The Sustainability of Adaptive Co-Management

From the adaptive governance literature, one can easily spot the inherent resemblance between adaptive co-management principles and pervasive sustainability definitions. The management of *social-ecological* systems, as expressed by Berkes and Folke (2002), expresses an integration of human and natural systems under adaptive co-management theory. This sentiment is thoroughly contemplated by Campbell's integration of human systems elements (society and economics), natural systems (the environment), and the conflicts that lie within its integration. The argument can then be made that adaptive co-management, when executed properly, achieves sustainability.

The two concepts tend to be used in tandem within governance studies. For example, the quantitative survey evaluation by Schultz, Duit, and Folke (2011), which assessed the performance of Biosphere Reserves (linked to adaptive co-management principles), found a supporting relationship within its overall results:

Effectiveness in sustainable development goals was associated to participation by local inhabitants. Adaptive co-management practices were associated with a higher level of effectiveness in achieving development goals, and this higher effectiveness did not seem to be at the expense of biodiversity conservation. (Schultz, Duit, & Folke 2011:662)

Furthermore, the essential features of adaptive co-management include both sustainable development efforts and an integrated approach to development. In full, these include (1) involvement of both local inhabitants/communities and governments in decision-making (a defining condition for co-management), (2) conservation and sustainable development efforts pursued in concert (social-ecological systems approach), (3) dialog, collaboration, and integration of different objectives, (4) monitoring and responding to ecosystem feedback performed combining different knowledge systems, including science, and (5) a shared vision has developed (Schultz, Duit, & Folke 2011:666). Adaptive co-management, therefore, is a sustainable practice. Sustainability is achieved through a social-ecological balance and leads to higher perceived effectiveness in achieving development goals at no cost to conservation. Sustainability through a social-ecological balance, therefore, is more effective than conventional methods of natural resource planning.

Balanced is Better

Why should Louisiana's Coastal Master Plan *not* be biased toward environmental protection? It is, after all, an environmental plan. In countless regions, plans have been separated by purpose. Economic development plans are biased toward economic prosperity, social policy plans are biased toward social equity, and environmental plans are biased toward ecological health. Nevertheless, a piecemeal focus will result in piecemeal results.

If sustainable development goals can be achieved, as perceived in the Biosphere Reserves (Schultz, Duit, & Folke 2011), while local inhabitants participate in the planning process without reducing the effectiveness of key conservation goals, more citizen buy-in and goals are still achieved. Essentially planners will be spending less time in negotiation and conflict resolution at the end of the process. Discussion and negotiation should occur throughout the participatory process instead.

Furthermore, the argument that Louisiana's Coastal Master Plan is not sustainable is beyond a debate in semantics. It is more than an error in terminology. The integration of social and ecological dimensions is one of the most vital and challenging aspects of planning. Simply acknowledging that the challenge exists is only the beginning. Scott Campbell argues that the three axial conflicts of the planner's triangle, between economic growth, environmental protection, and social justice, are mutually dependent based not only on opposition, but in collaboration (Campbell 1996:300). If planners ignore this dependence by ignoring particular conflicts as opposed to others, the result will be a disingenuous, unsustainable plan. Of course, achieving sustainability should not be considered a utopian result free of conflict and full of societal acceptance. The true achievement of sustainability continues to be elusive. Conceptualization and sustainable practice is an iterative and evolutionary process.

Louisiana's Coastal Master Plan: Claims of Sustainability

Louisiana's Coastal Master Plan labels sustainability as a decision criterion, which allowed the team to "consider different ways that risk reduction and restoration projects could affect the coast." The CPRA pithily defines the function of sustainability last of all criteria: "This criterion places a higher value on restoration projects that keep building or sustaining land 40 to 50 years after they are built" (CPRA 2012a:57). The body of the text within the plan directs readers to Appendix B, promising more details about the decision criteria. As a principle to serve as a guideline for fulfilling the master plan's mission and objectives, "seeking sustainability" is narrowly described:

The master plan seeks the long term sustainability of the coast while recognizing the urgent need for action. A sustainable system is one characterized by consistent levels of productivity and resilience (i.e., the ability to withstand naturally variable conditions and/or recover from disturbances). Creating a sustainable system will reduce the long term costs of projects, both in terms of energy use and operation and maintenance expenses. The master plan relies, to the maximum extent possible, on natural cycles and processes. This will be done while keeping limited funding and resource budgets in mind (CPRA 2012b:B-8).

By conducting a content analysis on the passage above, we can break down the function of each sentence. First is an introductory objective, followed by a definition of a sustainable system in the second sentence. The third sentence is a hypothesis for the effects of such a system. The fourth and fifth sentences do not expound upon sustainability, but provide support for the master plan itself.

Sustainability and Economic Growth

Introducing budget concerns into a principle labeled “seeking sustainability” presents confusion. Sustainability under these terms seems to more closely relate to productive efficiency (i.e., reducing long term costs of projects) than stewardship of the environment. In reality, cost effectiveness and budgeting considerations for restoration projects, though related to the planning process itself, are unrelated to the overall sustainability of the plan and its subsequent results for the coast. The third and fifth sentences relating to costs and funding should be relocated to describe budgeting principles, not social-ecological sustainability principles. One may then ask, why are project funding concerns irrelevant to sustainability, when economics is a primary pillar of sustainability? While economics is a primary consideration of sustainability, the consideration lies within sustaining the economic wellbeing of the region, and should not be specific to CPRA’s pocketbook. To clarify further, sustainability considers the economic effects of vital industries along the coast, not the plan budget.

For further consideration, CPRA’s definition of sustainability can be isolated: “A sustainable system is one characterized by consistent levels of productivity and resilience (i.e., the ability to withstand naturally variable conditions and/or recover from disturbances).” Productivity is left undefined. Perhaps it implies the production of benefits to reduce risk, which could include potential failure of levees and floodwalls; risk to economic trends and demographics; or flood frequency (CPRA 2012a:92). Perhaps productivity alludes to the prospect of land gain, which is estimated to begin within the time period of 2042-2051 through the implementation of the master plan. Either way, the definition, as written, is ambiguous and constrained.

Sustainability and Environmental Protection

The appendix then succinctly describes “sustainability of land” as a decision criterion:

This decision criterion seeks to reflect the sustainability of land created by restoration projects. Sustainability is approximated by a simple measure of persistence of land: the degree to which land that is built 40 years after construction is present 10 years later (50 years after construction). Specifically, this decision criterion is equal to the changes in land between the 50th and 40th year after construction is completed. Scores greater than or equal to zero indicate that land is persisting after 50 years (CPRA 2012a:B-19).

As mentioned previously, sustainability takes on a narrow definition specific to biophysical systems. The passage above describes a methodology used to create indices which measures land change from 40 to 50 years after project implementation. None of the decision criteria account for overall sustainability. The elements which could approach sustainability are presented in a piecemeal fashion as decision criterion. In full, these include distribution of flood risk across socioeconomic groups; use of natural processes; sustainability of land, operation and maintenance costs at year 50; support of cultural heritage; flood protection of historic properties; support of navigation; flood protection of strategic assets; and support of oil and gas (CPRA 2012b:B-17-24).

Sustainability and Social Justice: Assessing the Balance

Furthermore, the disparity between economic development, environmental protection, and social equity concerns (i.e., Campbell’s sustainable planner’s triangle) is apparent within Appendix B. References to master plan objectives appear after each listed decision criterion. In other words, each decision criterion fulfils one of the objectives listed on pages 56-57 of the plan’s main body. These include (1) flood protection, (2) natural processes, (3) coastal habitats, (4) cultural heritage, and (5) working coast. The first three objectives (flood protection, natural

processes, and coastal habitats) are environmental in that they deal with environmental risk. The fourth objective (cultural heritage) is social, and the fifth (working coast) is economic.

The appendix also lists decision criteria. These include long term progress toward risk reduction, near term progress towards risk reduction, long term progress towards creating land, near term progress towards creating land, distribution of flood risks across socioeconomic groups, use of natural processes, sustainability of land, operations and maintenance costs at year 50, support of cultural heritage, flood protection of historic properties, support of navigation, flood protection of strategic assets, support of oil and gas, progress towards risk reduction metrics, progress towards ecosystem services metrics, and critical landforms.

Six of the decision drivers/decision criteria support objective one (1); three decision criteria support objective two (2); one addition metric supports objective three (3); two decision criteria support objective four (4); three decision criteria support objective five (5); and one additional metric contains no reference. This means, a total of ten decision drivers, criteria, and metrics support environmental objectives; whereas, two decision criteria support a social objective, and three decision criteria support an economic objective. This is a 67 percent environmental, 13 percent social, and 20 percent economic split. One could potentially argue that distribution of flood risk across socioeconomic groups could also be a social equity concern and not only an environmental one. In this case, the distribution could be 60 percent environmental, 20 percent social, and 20 percent economic. Either way, the decision criteria are clearly biased toward environmental objectives, presenting us with the issue of an unbalanced, unsustainable planner's triangle.

By leaving out considerations for economic development and social equity within its sustainability definitions, and without addressing those tensions which lie between primary

considerations, the CPRA misses an opportunity to broadly conceptualize the social-ecological issues of the coastal region. Therefore, the plan fails, first, to be truly comprehensive and second, to be sustainable in a broad sense.

Analysis of Adaptive Co-Management: Participation

Following Arnstein's "ladder of citizen participation," the level of citizens' power as executed in Louisiana's 2012 Coastal Master Plan, would hover around consultation or placation. In her article, Arnstein creates an eight-rung typology of citizen power: manipulation, therapy, informing, consultation, placation, partnership, delegated power, and citizen control. The ladder is fully represented in Figure 4. Under *manipulation*, she refers to people placed on "rubber stamp advisory committees or advisory boards for the express purpose of 'educating' them or engineering their support" (Arnstein 1969:218). This typology exemplifies citizen advisory groups without real power, who were actually advised by officials and not the reverse. Arnstein then considers the next rung, *therapy*, to be invidious, dishonest, and arrogant, where "citizens are engaged in extensive activity, but the focus of it is in curing them of their "pathology" rather than changing the racism and victimization that create their 'pathologies'" (218). Next up is *informing*, where one-way communication occurs in public meetings. *Consultation* is said to be a legitimate step toward full participation. Nevertheless, Arnstein notes the restriction of citizens' ideas at this level—a "window-dressing" ritual—where citizens have "participated in participation." According to Arnstein, "People are primarily perceived as statistical abstractions, and participation is measured by how many have come to meetings, take brochures home, or answer a questionnaire" (219). Tokenism is still perceptible under *placation* strategies. This is the level at which Louisiana's Coastal Master Plan operated:

An example of placation strategy is to place a few hand-picked “worthy” poor on boards of Community Action Agencies or on public bodies like the board of education, or police commission, or housing authority. If they are not accountable to a constituency in the community and if the traditional power elite hold the majority of seats, the have-nots can be easily outvoted or outfoxed. (Arnstein 1969:220)

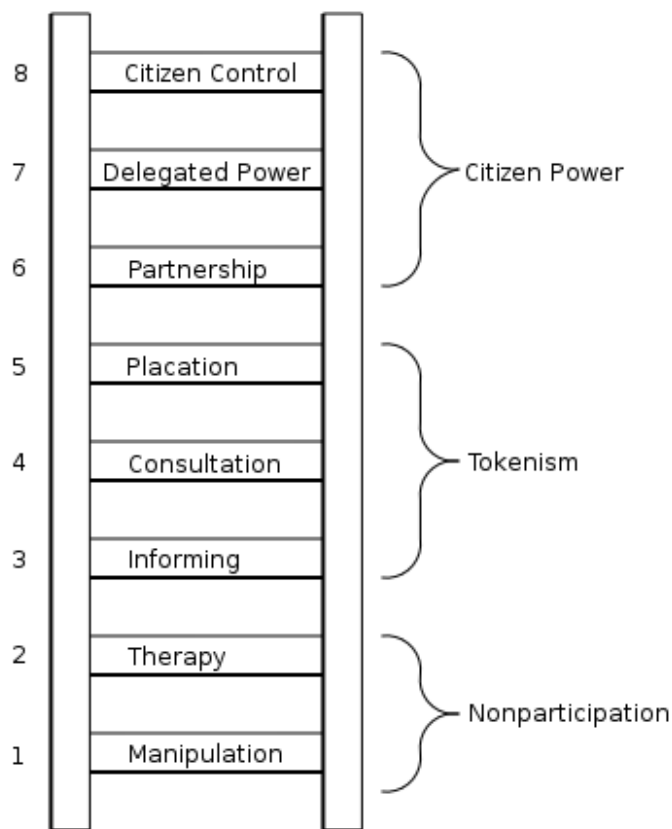


Figure 3. Arnstein’s ladder of citizen participation (Arnstein 1969)

At a higher rung is *partnership*. Under this regime, citizens and power-holders share planning and decision-making responsibilities (i.e., through joint policy boards, planning committees). At the highest levels of citizen power are *delegated power* and *citizen control*, where citizens achieve dominant authority in planning through negotiations, or where residents are in full charge of policy, management, and negotiation respectively (221-223). Each level, or rung, is then grouped further. Manipulation and therapy are forms of *nonparticipation*. Informing, consultation, and placation are forms of *tokenism*. Finally, partnership, delegated power, and citizen control are forms of *citizen power*. The need to move from a tokenism regime to one of citizen power in Louisiana's Coastal Master Plan is begged by citizens in a variety of ways.

The evidence of tokenism lies within the public comments, logged in Appendix G of the plan (CPRA 2012b). Appendices are all publicly accessible online. These public comments are labeled, "Unique." Unlike form letters, these comments were written and submitted by individuals or groups with distinctive concerns. Citizens were able to discuss considerations at length without limitations. Public comments were submitted after the release of the Draft Master Plan on January 12, 2012 and before the deadline of February 25, 2012.

The planning approach to the Coastal Master Plan is not unusual, in that many planning processes utilize public hearings and public comment submittal periods. In the case of an ambitious State regional plan claiming comprehensiveness and sustainability, however, the expectations for citizen engagement are higher, and the need for community buy-in is much more crucial. To examine the earnestness of the Coastal Master Plan, one must first take a peremptory glance at the care taken toward submitted public comments. At the time of this publication, Appendix G-5, containing the plan's unique comments, reproduces several pages of

commentary upside-down in its downloadable format. Additionally, the comments are not in any chronological or thematic order, and many of the submittals are duplicated in various places. The level of thoughtfulness taken toward these public comments is dubious.

Inaccessibility

Numerous citizens felt that meetings were inadequate or inaccessible, while others felt that materials were not properly distributed for the public to give fair input:

I respectfully request that **another round of meetings**, be held across the state. The citizens of Monroe, Vidalia, etc. need to know what saving the coast means to them, and they need to **become motivated** enough to ask their representatives to strongly support the concept.

(Frank J. Beninate III, President of Wetlands Services, Inc.)

Although a massive undertaking, the discussion and formation of the Master Plan should start sooner in order to give the public and affected people **more time to study and participate** in commenting and selection of projects. Much of the technical information that went into building the Master Plan is **still not available to the general public**. This was evident at several of the public comment meetings when listening to coastal elected officials and residents who had huge disagreements in the selection of projects in their areas.

(Louisiana Shrimp Association)

All the residents see is false hope and untrue statements to gain votes. Why not have **open meetings** in the lower end of Plaquemines Parish to address the areas where the real problems are happening now, but instead you make meetings **difficult to make** by having them 50-60 miles away. Just another reason people don't trust politicians.

(Edward Derouen, Jr.)

While this public comment period is important and we appreciate the opportunity to submit comments, BISCO has noted that this draft **does not include** in its booklet format (the most readily accessible format for the population with whom we work) **any of the appendices** where we have been told there are more details available. If the public can't see the appendices, **do they really exist or have an impact?** And how can the public comment if they can't see the appendices?

(Bayou Interfaith Shared Community Organizing (BISCO))

Although they were requested numerous times, prior to the release of the Draft 2012 Coastal Master Plan, **hard copies** of clear, easy to understand, detailed project descriptions, summaries and maps for each of the projects were **never provided to citizen representatives or the public**...Gaining a clear understanding of a project and its potential impacts on them and their communities from a paragraph made up of a couple of sentences and trying to find that project on a large map can be overwhelming, making it **extremely difficult to make educational comments** at a public meeting. This may lead people to support a project that they would not otherwise support or oppose one they may have supported.

(Tracy Kuhns, Executive Director of Louisiana Bayoukeeper, Inc. and Michael Roberts, President of the Association of Family Fishermen)

Involvement of Minorities

Upon more thorough examination, the aforementioned lack of social equity consideration is a serious shortfall to many, as supported by the multitude of comments from Louisiana citizens. The plan failed to utilize traditional knowledge of residents. In numerous instances, citizens felt that minorities were excluded from the planning process and do not receive the benefits of the protection given to others:

According to the 2010 Census, over 1/3 of the individuals residing in areas where coastal restoration projects will occur are made up of minorities. We believe that it is essential that such **minorities be an integral part** in the development of the Master Plan.

(Lovera Shaula, Catholic Charities Archdiocese of New Orleans)

In addition to the CPRA, there are approximately 175 people that were cited as part of the various teams, groups, panels, etc. that provided some input into the plan. However, I am concerned that many of these highly educated people might have a lot of good information but don't really understand or appreciate the intricacies of the area as well as the **people that have lived in the coastal area for generations**. Most of these locals understand the land and the resources perhaps better than the more educated folks that are cited in the plan. **More of their input** should have been sought and used in the preparation of the plan.

(Citizen of Vacherie, LA)

Our coastal heritage is more than nostalgia. Our coastal communities are repositories of contextual coastal knowledge that can improve coastal projects. Coastal communities have **traditional knowledgebases that can be integrated** with more formal scientific efforts, to allow the state to rapidly determine whether our efforts at restoring are succeeding. The SMP [State Master Plan] should work more closely with parish planning committees to ensure that local knowledge of an area is included in project planning, and that **local communities** are updated on the progress of projects.

(Gulf Restoration Network)

...However, I am disappointed that the protection of **cultural heritage and equity among socioeconomic groups**, at least as they have been operationalized in the plan, did little to nothing to shift the restoration and protection projects to do more for communities in South Terrebonne, Lafourche, and Plaquemines where **unique ethnic communities that literally exist nowhere else on earth** are exceptionally vulnerable and receive precious little additional protection.

(Brian Marks, PhD, University of Arizona, Bureau of Applied Research and Anthropology)

The lack of restoration and protection for communities with **high percentage numbers of indigenous people** (and no planning protecting the tribal identities or cultural isolation rights of those people in the event of forced relocation) appears as a classic **“environmental justice” misstep** by the MP and the State. This should be addressed rapidly and strongly. And Acadian populations also make up these rural areas allowed to degenerate. It's like the 1755 Acadian Expulsion or the “Trail of Tears” all over again!

(Patty Whitney)

Community Representation

Many comments referred to the total lack of local community representation on the Framework Development Team, focus groups, or other planning entities. The value of coastal communities is also underrated by the CPRA according to the public:

To date, there is **not one coastal community representative** (people who live and work there) and no representative from any State Recognized Native American Tribe, no representation from Asian/American communities and no representation from low income, multi-cultural fishing families. There are, however, 3 National Environmental Non-Governmental Agencies (ENGO) and 2 Louisiana ENGO's who claim to represent the interests of Louisiana's coastal communities, three oil and gas representatives, 3 representatives of the transportation industry and representation from all relative state and federal agencies. **Without a seat at the table**, it is difficult, if not impossible, for disadvantaged citizens **to have their voice[s] heard**.

(Tracy Kuhns, Executive Director of Louisiana Bayoukeeper, Inc; Michael Roberts, President of the Association of Family Fishermen)

The SMP **lacks a "Community" focus group**, separate from the parishes, for those communities at greatest risk from the coastal crisis. Proactive, ongoing communication with the people who will be evacuating, organized according to how many groups actually prepare, evacuate, and rebuild, will serve the implementation, communication, and evaluation of projects.

(Gulf Restoration Network)

The **landowner community** must continually be involved in the Master Plan process and kept abreast of any proposed changes being considered, particularly in regard to laws and regulations including mitigation requirements. It cannot be stressed enough that **communication early and often** will be key to the success of the Plan.

(Louisiana Landowners Association, Inc.)

Overall the plan is a good start but falls short in that it appears that **local agencies were not fully engaged**, especially in the beginning of the process. There is a lot of knowledge at the local [level] that the plan could benefit from. Local folks know and understand the good, the bad, and the ugly about their respective areas.

(Citizen of Vacherie, LA)

Landowner input and involvement is crucial. With the majority of the coast held in private ownership, it baffles me why more credence seems to be given to folks who neither live, work or pay taxes in the area of proposed protection.

(Timothy J. Allen, General Manager of Apache Louisiana Minerals, LLC.)

Unbalanced Sustainability

In addition to their lack of representation on decision-making boards, citizens felt that equity of community, commerce, and environment, as advocated by previous reports was not translated into the Coastal Master Plan. For example, they note the Executive Order to establish the Gulf Coast Ecosystem Restoration Task Force (GCERTF) (Executive Order No. 13554 2010) under the U.S. EPA and the resultant Secretary Mabus Report (Mabus 2010). Note the likeness of these equitable considerations to those prescribed above by Campbell in his “planner’s triangle.” Citizens also felt that public meetings were inadequate, and the cultural heritage information was written by academics, far removed from the communities themselves:

Communities were relegated to the insignificant and inadequate “public comment” phase of interaction on the drafting of the plan. The end result is that projects were selected that reflect an incomplete and negatively weighted result for communities and the people that reside there. This is of course in complete contra-indication of both the Mabus Report and GCERTF Report, which both emphasized the **necessity for including three sectors equally in plans for restoration and protection: community, commerce, and environment.**

(Bayou Interfaith Shared Community Organizing (BISCO))

This plan does not seem to adequately address the mandates presented in both the Mabus Report and the Report of the Gulf Coast Ecosystem Task Force that restoration recovery should be a **three-pronged strategy: addressing an equitable balance of commerce, environment and community**. Once again, community is addressed as an afterthought. The Framework Development Team did not include community organizations. The culture and heritage members of the team are academics from the ivory towers of universities, and while they are all outstanding in their educational fields, none are working on a day-to-day basis within the streets of the communities.

(Patty Whitney)

Social Vulnerability

Numerous agencies that operate within the Barataria and Terrebonne Basins collaborated in order to bring attention to matters of social vulnerability. Again, the theme of community, environmental, and economic equity arises. Beyond scientific analysis, human factors must be addressed. Specifically, they seek a social vulnerability analysis to weigh the pros and cons of each option, which will factor in to the decision-making for project prioritization. They ask for consideration toward local economic welfare through the support of local job creation during project implementation. Again, like many of the other groups, they ask for community inclusion, especially for vulnerable populations, in the decision-making process as granted to other planning entities:

An effective Gulf Coast recovery plan must **equally value communities, environment and economic welfare** to promote a more resilient coast. With the increasing vulnerability of the communities within the Barataria and Terrebonne Basins, we support a plan that undertakes projects not only for their scientifically determined value, but which also provide the **greatest positive impacts and reduce the risks for economically and socially vulnerable coastal populations**. . . Finally, future planning processes should further engage **local NGOs, landowners, and community groups** as an integral part of the Framework Development Team and other key planning groups, including the development of **guidelines for responsible and inclusive decision-making processes**, sensitive to the challenges of vulnerable populations.

(Joint effort by agencies within the Barataria and Terrebonne Basins)

There must be a **human component** to a successful restoration effort. A restoration plan that has any reasonable chance of being implemented is not one that can be merely engineered or one that is driven only by science. **Success depends on more than engineering and science**. It is imperative to the success of this restoration effort that our communities and our culture be considered. BTNEP certainly agrees that a restoration project must adhere to established engineering and scientific principles, but it must also be **acceptable to the majority of stakeholders**. Conflicts are inevitable as we move forward, but these conflicts must be diminished if our restoration effort has the benefit of community consensus and support. This is only possible by **active engagement and involvement of the public** and the agencies and groups that represent them.

(Kerry M. St. Pé, Program Director of the Barataria-Terrebonne National Estuary Program)

Refine computer modeling for risk to place **more ‘worth’ on community and residential damages** rather than oil & gas strategic assets (at a time when major oil companies are reaping major profits it should not be the people of Louisiana who pay to protect their oil rigs, pipeline, refineries, or oil/gas storage facilities) when 40-60% of Louisiana’s coastal land loss is directly tied to the exploration & operations of the oil & gas industry. (Example levee structure on west side of Calcasieu River near Interstate 10 mainly protects Petro Chemical Plants)

(Darryl Malek-Wiley, Sierra Club)

Misunderstanding of Native Populations

In the name of science, CPRA neglects the needs of America's oldest members. Citizens find that indigenous tribes, holders of invaluable traditional ecological knowledge, are misunderstood and left unprotected by the plan. More consideration was given to the oil and gas industry than to the protection of traditional communities.

What I heard in the public meeting did not seem like an all inclusive plan, more so it seemed like a plan to protect the highest tax base areas...I am a member of the **Isle de Jean Charles Band of Biloxi-Chitimacha-Choctaw**. Our burial grounds are in jeopardy as are the lands that our people have **inhabited for generations**. Our herbs for healing have already disappeared as well as our trees. Our way of life, fishing, shrimping and harvesting oysters has been neglected for what it adds to the state and our way of life. Once, we were a **self supporting tribe** who got what they needed from Mother Earth, **now we shop in the stores** and buy seafood from places other than our waters. Our land was once 5 miles wide and now it is lucky if it is ½ a mile. We are part of the protection for Houma and other coastal communities but **yet we are unimportant**. Indian artifacts are being returned across the country to their respective tribe but at the same time our **artifacts are left to wash away**...Let the oil and gas industry pay for dredging and restoration of our lands off the many profits they have received from our state, our people. **Let us not say that a group of people is unimportant** and deserve to be stripped of everything. Let us not pretend that we are God and doom a coastal area based off the tax dollars it provides the state of Louisiana. **Let us not continue the discrimination** that has been rampant for generations against the Native American peoples and classes which one deems equally unimportant. I was born and raised and choose to die in the State of Louisiana. I love my home, don't you?

(Kelly Bagwell, Member of the Isle de Jean Charles Band of Biloxi-Chitimacha-Choctaw)

Cultural Vulnerability and Tokenism

Furthermore, the following submission represents a classic example of tokenism by the CPRA. It is a public comment submitted by a Native American of Terrebonne Parish. The comment is preserved in its entirety in Figure 5 to demonstrate a point in full. She submits a lengthy and eloquent explanation of the importance of her people, the richness of her culture, and the vulnerability of future generations as the plan stands. She explains that the tribe blames no one, but asks for the plan to present relocation strategies in order to help preserve the culture, heritage, and traditions of her people:

Comments

I am the Active Chief of the Grand Caillou/Dulac Band of Biloxi-Chitimacha Confederation of Muskogeas. We are located in the low lying area of Terrebonne Parish.

I would like to open with an American Indian proverb I believe to be fitting to this subject: Treat the earth well. We do not inherit it from our ancestors; we borrow it from our children.

Everything we do and don't do, are our legacies left to future generations. That is very evident with all of the discussions on the extremely important and heartbreaking issues of coastal erosion and what's not being done to repair what has been forced upon us in the 2012 Master Plan.

There are options for protection and adaptation, but nothing that would be considered suitable for the Tribal Members and many residents of our low lying bayou communities that will be left to wash away. So, once again we presented with a plan that contains no Equitable Balance as mandated by the Gulf Coast Ecosystem Restoration Task Force and the Mabus Report.

Studies have been ongoing for nearly forty years with no resolve to our dilemma! In looking at the 2012 Master Plan, the only option our people have been left with is to relocate.

You may not know it, but our areas are rich in culture and heritage, and being forced to relocate individually will basically annihilate the beauty that is being an American Indian of the Grand Caillou/Dulac Community, a life long resident or any American Indian that resides in the unprotected areas of coastal Louisiana and all of the traditions held so very dear to each and every one of us.

We are not trying to blame anyone for the choices made by those before us. We understand that there are difficult decisions to be made. We only ask that you include relocation strategies in the 2012 Master Plan and that it would include for the relocation of communities as a whole for the preservation of culture, heritage and traditions of a people that have suffered many losses at the hands of others that repeatedly see them as expendable targets.

Thank you for your time and God Bless!

Figure 4. Comment by Shirell Parfait-Dardar, Active Chief of the Grand Caillou/Dulac Band of Biloxi-Chitimacha Confederation of Muskogeas (CPRA 2012b)

The CPRA added a page labeled “Transition Assistance” to the final plan. It did not present relocation strategies. It did, however, vaguely explain that the CPRA needed to “develop a planning framework to help communities, businesses and individuals adapt to anticipated changes in the landscape” (CPRA 2012a:172) This shows that the CPRA acknowledged the public comments regarding relocation assistance, but cannot deliver what is requested. Since the public had not been engaged earlier in the process, location strategies were not requested, at least

to a large extent, until the draft commentary phase. Relocation strategies, or any other requests requiring time to execute for that matter, could not have been completed in time for the submission of the final plan. The CPRA did, however, use the American Indian proverb in the introduction (20), to illustrate a level collaboration with Native American Tribes and an understanding of traditional land practices.

Cultural Heritage and Ethnic Blunders

Such faux pas toward ethnic groups appear again in the cultural heritage section of the draft plan, as sardonically pointed out by Dr. Brian Marks:

...And while you're at it, there's a couple silly, objectionable **errors** you've made regarding **ethnic groups** and communities in coastal Louisiana. (Not to mention that you don't address how the plan affects ethnic and racial groups differentially, but that's for another conversation.) You ought to write **the name of the Houma Nation correctly**; you only say 'Houma Nation' in the plan. You ought not add insult to injury by not just **failing to document how vulnerable Dulac, Point au Chien** (you botched its name in two ways—No 's' on Chene(s) despite the prior plural 'aux' and among American Indians, the bayou is more commonly called 'Point au Chien'), and Isle de Jean Charles will continue to be under this plan, but you **spelled their tribal name wrong**, even though you put a **picture of their Principle Chief** on the front cover of your report. And the **Cajuns of Lafourche**, where the largest single historical migration of Acadians arrived in 1785, might be surprised to know **they don't exist**, and only 'White Creoles' live in South Lafourche. (Be sure to tell 100.3 FM in Larose to change its slogan to 'The Ragin' White Creole!') And the **exclusion of African Americans** from South Terrebonne (i.e. Bobtown in Dulac and Smithridge in Chauvin) and Chalmette and the **exclusion of the Vietnamese community** from Houma (Village East) is wrong. This brief list is not exhaustive of the significant ethnic communities missing from your list, but you get the idea.

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Chapter VII

Recommendations

While Louisiana's Comprehensive Master Plan for a Sustainable Coast may have relied on cutting edge technology to evaluate the needs of the coast, it is not, in fact, sustainable by virtue of its technocratic planning framework. By embracing the possibilities of science in combination with traditional ecological knowledge, planners can foster collaboration within the community, improve local support, and satisfy diverse local and regional interests. How could co-management reform Louisiana's Coastal Planning process? This research question is explored by posing recommendations for an updated planning framework for Louisiana's 2012 Coastal Master Plan. These recommendations are specific to the Louisiana case, but basic framework can also be extended to other similar environmental master plans.

- 1) The State of Louisiana should pass a mandate, or State Executive Order, requiring a power-sharing structure between government (i.e., the State of Louisiana), experts (i.e., biophysical and social scientists, planners or other professionals), and citizens (i.e., those holding local knowledge) to ensure plan sustainability which includes social equity concerns (i.e., Campbell 1996) and citizen power within participation processes (i.e., Arnstein 1969).
 - a. To create a partnership level of citizen power (Arnstein 1969), a joint policy board should be formed. Citizens on the local board should include local Native American Tribes possessing traditional ecological knowledge, as well as African Americans, Cajuns, Asians, and others with local knowledge.

- b. Expert advisory committees should be made up of both the biophysical and social sciences in balanced and reasonable proportion, such that environmental protection, economic development, and social equity may be equally represented. Expert committees must work with the local citizen committee to combine traditional and conventional management practices of Louisiana's coast (i.e., Kristofferson & Berkes 2005).
 - c. The State of Louisiana will not lose its authority or accountability to other stakeholders, but should be required to make decisions in partnership with, or in the best interest of citizens, experts, and the State as a whole. Citizen leaders should also be held accountable for their decisions, and shall be paid honoraria for their efforts, and shall be given the financial resources to hire or fire consultants, giving them "genuine bargaining influence over the outcome of the plan" (Arnstein 1969:221-222).
- 2) Involve Southern Louisiana's public from the beginning of the plan's conceptual stage in order to ensure iterative group learning, collaborative design, and trust-building are achieved. These are foundation pillars of adaptive co-management (i.e., Holling 1973; Folke *et al.* 2002; Ostrom 2003; Berkes 2009).
- a. Local citizen boards should be formed and consulted from the beginning of the planning process. Because the intent is to create a partnership (Arnstein 1969), both the citizen committee and scientific committees, such as those on the Framework Development Team and Focus Groups, will work together before the conceptual plan is formed. This will ensure that all groups are generally in agreement before substantial work progresses.

- b. Public meetings should be held in the beginning stages, and should be engaging and participatory, unlike traditional public hearings with limited comment periods. These public meetings should begin in the conceptual stages of the plan, when the Citizen Committee and Framework Development Team are working collaboratively to frame the needs of all stakeholders, but before substantial engineering, modeling, or decision-making occurs.
 - c. Outreach planners should make several attempts to reach local populations, rather than expecting the public to reach them. This was a common complaint within the public comments log. Those doing outreach should be specially trained to hold engaging public meetings and learn to take on effective dispute resolution techniques as they may apply to communities of Louisiana. By visiting communities, leaders are able to learn from others and build trust. Public hearings should expand to counties in the Northern, non-coastal segments of Louisiana, since these environmental decisions affect the population of the entire state, if not the U.S. as a whole.
- 3) Appoint local, well-regarded individuals from the community to provide outreach, promote resource stewardship, and hold positions on power-sharing committees.
- a. Individuals should be nominated and voted into power on the citizen committee by their fellow community members. Members of the citizen committee should represent all coastal parishes in Louisiana. All historical minority groups should also be represented on the committee at all times. These “Cultural Groups” include Anglos, Cajuns, Native Americans, White Creoles, Creoles of Color, Isleños, Croatians, Spanish, Vietnamese, and Italians (CPRA 2012:I-17). These

stewards should serve as facilitators, coordinators, and partial power-holders in the co-management framework.

- b. These actors will be responsible for maintaining social networks within the community, and endeavoring for social-ecological resilience. This message should be clearly conveyed to Louisiana voters upon their appointments.
- 4) Embrace both traditional and conventional techniques of natural resource management (i.e., Kristofferson & Berkes 2005).
- a. Utilize traditional ecological knowledge of native populations passed down by generations. Framework Development Teams should coordinate scientific modeling efforts with local citizens, as advised by the Citizen Committee.
 - b. Note accounts of locals who may have intimate knowledge about species monitoring or land change. The Framework Development Team and Citizen Committee should create an official initiative to record and map knowledge about local species monitoring, so information can be utilized and coordinated with recent, conventional monitoring efforts.

Discussion and Conclusions

In Louisiana's complex and changing coastal ecosystem, residents still hold hope that their home can be saved and their way of life can be preserved. From technocracy to traditionalism, reductionism to holistic approaches, social-ecological system management should not be mistaken for a straightforward endeavor. By considering adaptive co-management, policy makers allow for collaboration, trust-building, flexibility, and iterative learning amongst varied institutional linkages. Though it is not to be considered a panacea, adaptive co-management

continues to gain attention as an effective tool for the planning and management of fragile ecosystems.

Louisiana's Comprehensive Master Plan for a Sustainable Coast is primarily strong or neutral as a general, or master plan, according to the analysis. The study follows William Baer's suggested evaluation criteria, appearing in "General Plan Evaluation Criteria: An Approach to Making Better Plans." The plan critique analysis found two or more weaknesses under "rational model" considerations, procedural validity, and adequacy of scope. Within this context, an imperfect level of plan efficacy was suggested.

In a region full of unique heritage, valuable resources, and resilient communities, Louisiana has an obligation to develop a Coastal Master Plan of a genuinely sustainable nature. Sustainability, of course, broadly requires a fair balance of environmental protection, economic development, and social equity, according to eminent planning scholars such as Scott Campbell (1996). This lies in contrast with CPRA definitions which narrowly refer to ecological resilience and land building capacities only. In the sustainability analysis, the plan document itself provided the data. Of the five plan objectives presented, three are environmental, one is economic, and one is social. The decision drivers and decision criteria listed supported these objectives. By categorizing these decision drivers/criteria further, the research shows that plan considerations were 67 percent environmental, 20 percent economic, and 13 percent social, undeniably achieving an unbalanced "planner's triangle," or a lack of sustainability.

By sharing decision-making power with local citizens, Louisiana can better accommodate the interests of its residents. Sherry Arnstein's "ladder of citizen participation" (1969) shows us that tokenism occurs in public meetings when citizens are merely informed of decisions being made, are consulted but given no power, or are placated. By referring to the unique public

comments log in the appendix, the research shows that people repeatedly and redundantly claim that social equity concerns are lacking.

Specifically they claim that materials were not sufficiently distributed; meetings were not equally accessible; local knowledge was underutilized; minorities were not adequately engaged; communities were not represented on planning teams; cultural heritage was undervalued; community, commercial, and environmental balances were not achieved; consulted academics were far-removed from communities; physical scientific analyses neglect human factors; social vulnerability analyses were not conducted; indigenous tribes were unprotected; industries received consideration over traditional communities; minorities appeared to be included in the plan when they felt otherwise; citizen requests for analysis could not be fully delivered, and mistakes appeared in the cultural heritage section. Each claim supports the theory that Louisiana's 2012 Coastal Master Plan was not sufficiently democratic, and citizens held little power in the planning process.

To confront the inadequacies of the 2012 plan, the study presented recommendations integrating solutions to purported shortcomings in the plan and alternative adaptive co-management framework as discussed in the literature review. These recommendations suggest power-sharing structures, citizen/expert committee collaboration, public engagement at early and conceptual design stages, diversity on citizen committees, and support for the coordination of traditional and conventional management practices.

Adaptive co-management sets governance at a standard above citizen placation or consultation. It ushers in a new wave of local engagement that allows for the people to make a difference. Despite its merits, adaptive co-management must be explored at a national level to

fill in knowledge gaps. The scarcity of adaptive co-management research in the United States presents a limitation on relevant studies. In large part, this thesis is meant to encourage the progressive thought processes of environmental planning agencies, and present possibilities for alternative governance strategies.

Forthcoming research needs to address relationships and emerging politics between entities sharing power, including citizen committees, expert committees, and the state. Additionally, new research should investigate public perceptions of citizen power through adaptive co-management in the U.S. Researchers may also explore governmental mechanisms which make adaptive co-management less prolific in the United States as opposed to other nations. Finally, forthcoming research should explore the possibilities of adaptive co-management based upon levels of acceptability within divergent states or regions of the U.S.

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