SOCIAL IMPACT ASSESSMENT METHODOLOGY FOR DIVERSIONS AND OTHER LOUISIANA COASTAL MASTER PLAN RESTORATION AND PROTECTION PROJECTS

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EXPERT PANEL

On January 7, 2014, The Water Institute of the Gulf convened an expert panel to help develop a methodology for conducting social impact assessments for proposed sediment diversions. The panel identified the essential elements to include in an effective SIA, as well as methods, sources, and procedures to operationalize social impact assessment in coastal Louisiana.

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INTRODUCTION TO SOCIAL IMPACT ASSESSMENTS

Activities that interact with environmental systems have typically relied on scientific analysis to project the impacts of these projects and have operated on the assumption that good science could reveal and remedy potential problems. This conceptualization often assumes that managing natural resources is a purely physical scientific enterprise. Good science is certainly essential, but because environmental management is fundamentally a human activity, effective predictions of human impacts demand, at the very least, equal attention to the social, political, cultural, and economic systems in which environmental management takes place (Ludwig et al., 1993). Social Impact Assessments (SIAs), as part of the larger environmental management enterprise, need to be approached with this in mind.

This fundamental principle applies specifically to projects outlined by Louisiana's Comprehensive Master Plan for a Sustainable Coast (Master Plan) (CPRA, 2012). The Master Plan includes an array of projects—both structural and nonstructural—that are intended to protect, stabilize, restore, and fortify the state's disappearing coasts. Structural projects for risk reduction include levees and floodgates. Sediment diversions and hydrologic restoration projects also include structures and are part of the restoration component of the Master Plan. The nonstructural projects in the Master Plan are elevation, flood proofing, and voluntary acquisition. Additional non-structural options discussed in the hazards literature include land-use practices and building codes. The goal of the present study is to develop a methodology for conducting social impact assessments for sediment diversions recommended in the Master Plan. This report focuses on projects that will divert sediment-bearing river water into estuaries and coastal marshes. Such actions will require environmental impact statements which should include a thorough and legally defensible SIA (ICPGSIA, 2003 and Vanclay, 2012). The Master Plan projects an overall investment of $3.8 billion toward sediment diversions (CPRA, 2012).

Some authorities note that globally, coastal zone management has fallen short in terms of effectively assessing social impacts because it has neglected adequate community engagement, which results in a "democratic deficit" (Vanclay, 2012, 149). Vanclay (2012) argues that a proper social impact assessment "is not a cost, but an investment in risk management that will reduce likely future expenditures by the early identification and remedy of potential issues that would otherwise lead to litigation, delays to approval, costs in the form of managing protest actions, and business lost through reputational harm" (Vanclay 2012, 155). This list of possible unwanted responses to coastal projects should resonate among those familiar with Louisiana's coast, and with projects that have not effectively engaged with stakeholders during the planning and implementation processes. The Master Plan calls for a "participatory process" that will enable citizens "to learn about and comment on the tools and processes that create the plan and not just the finished plan" (CPRA, 2012, 47 and 49).

While not mentioned explicitly in the National Environmental Protection Act (NEPA) of 1969, SIAs have become a fundamental part of the NEPA process since the 1970s, under the requirement that social sciences should be used to assess impacts "on the human environment." The human environment is generally understood to mean the intersection of human activity and the natural environmental systems (Kates, 1987). The Council on Environmental Quality (CEQ) reinforced this expectation in 1978 by stating that the "'human environment' shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment" (CEQ, 1978, quoted in ICPGSIA 1994). In addition to the legal requirements, there are procedural advantages for including an effective, and publicly engaged, SIA. Coastal management projects that have included an extensive public

participation have encountered minimal protest and litigation, thereby reducing the costs brought on by conflict or damage to public reputation (O'Faircheallaigh, 2010 and Vanclay, 2012).

The Interorganizational Committee on Principles and Guidelines for Social Impact Assessment (ICPGSIA) released its first set of guidelines and principles for conducting SIAs in 1993 and produced an updated version in 2003 (ICPGSIA, 1993, 2003). The major adjustment between the 1993 and 2003 versions was an expansion of the scope to include "policies, plans, and programs," and not just individual projects. In addition, after President William Clinton issued Executive Order 128989 in 1994, Environmental Justice became an essential perspective to include in SIAs. The executive order calls for a more finely nuanced assessment which seeks to identify potential uneven impacts based on income, race/ethnicity, and current practice, as defined by practitioners, extends this to include gender (ICPGSIA, 2003 and Walker, 2010).

There are well-defined principles and guidelines for conducting SIAs for projects that influence the human environment. The ICPGSIA defines SIAs as the "efforts to assess, appraise, or estimate, in advance, the social consequences that are likely to follow from proposed actions" (ICPGSIA, 2003). It elaborates on the definition by stating:

> *By social impacts we mean the consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organize to meet their needs and generally cope as members of society. The term also includes cultural impacts involving changes to the norms, values, and beliefs that guide and rationalize their cognition of themselves and their society. (ICPGSIA, 2003, 231)*

Ultimately, the SIA process focuses on the human consequences of projects that have environmental impacts (Gramling & Freudenburg, 1992). The SIA process also seeks to address the resolution of impacts.

SIAs have become a fundamental step in the preparation of Environmental Impact Statements, or Assessments as they are known internationally, and they provide a valuable avenue for community participation in the early stages of projects, plans, policies, and programs.

SOCIAL IMPACT ASSESSMENT PANEL MISSION

On January 7, 2014, The Water Institute of the Gulf (the Institute) hosted an expert panel to help develop a methodology for conducting social impact assessments for proposed sediment diversions. The goal was to assemble a viable method to assess or estimate, in advance, the social consequences that are likely to follow specific actions. The Panel specifically considered the following issues: (1) environmental justice issues with minority or low income users in the basin, (2) an undue economic burden on specific stakeholders from action compared to a future without action, (3) the economic viability of specific communities compared to a future without action, (4) the economic effects of action on specific fishing industries (e.g., oysters, shrimp) on a basin or coast-wide scale, (5) related social impacts commonly addressed in social impact assessments, and (6) community engagement in the Environmental Impact Statement (EIS) process.

The panel consisted of three experts familiar with coastal Louisiana and with expertise that would

enable the Institute staff to develop an effective SIA methodology. Robert Gramling, Professor Emeritus at the University of Louisiana – Lafayette, is a sociologist with extensive research experiences in coastal Louisiana and has been actively involved in developing SIA methods for more than twenty years. Edward Barbier, a distinguished professor of economics at the University of Wyoming, is a recognized leader in environmental economics and ecosystem services analysis. He also has experience working in coastal Louisiana. James Wilkins is the Director of the Law and Policy Program with Louisiana Sea Grant. As an attorney, he brings critical knowledge about the EIS process as well as extensive experience in Louisiana coastal matters.

The result was the identification of the "essential" elements to include in an effective SIA, methods and sources for conducting an SIA, and procedures to operationalize an SIA. This report describes those elements and proposes a draft workplan which could be pursued to develop an SIA for proposed diversions and other restoration and protection projects.

SIA ESSENTIALS

ICPGSIA principles and guidelines provide a solid foundation for conducting SIAs (ICPGSIA, 2003).[1] This international organization lists six principles that are foundational to an effective SIA. They are:

1. Achieve extensive understanding of local and regional setting;
2. Focus on key elements of the human environment related to, and impacted by, project, program, or policy;
3. Utilize sound and replicable scientific concepts and methods, based on widely accepted, peer-reviewed natural science, social science, and economics;
4. Provide quality information for decision making;
5. Ensure that environmental justice issues are fully described and analyzed;
6. Undertake project, program, or policy evaluation/monitoring and mitigation.

In line with these basic principles, there are several essential components of SIAs that will precede sediment diversion projects. It is critical to begin the social impact assessment as soon as possible. Since it is well established that even the announcement of a proposed project can have social and economic ramifications, this phase of planning should parallel environmental investigations and feed into that research. The essential elements include:

A. Full integration with the biophysical investigations conducted in preparation for the EIS

It is imperative that any and all social impact assessments be completed in consultation (and coordination with) those studying the biophysical and hydrological impacts of the diversions, and other Master Plan projects. To achieve coordination, projects need simultaneous data collection. Without reliable models about the biophysical impacts, knowledge of social impacts will remain elusive. In order to project how humans will be influenced, it is essential to know what impacts there will be on the natural resources that support local natural resource-based economic activities. Many social impacts will flow directly from environmental changes, while others will be secondary social alterations prompted by environmental changes (Turner, 2000).

[1] Details about the procedure are available in ICPGSIA, 2003, and http://www.nmfs.noaa.gov/sfa/social_impact_guide.htm.

B. Effective inclusion of local knowledge and participation in the process

Based on the first principle of the SIA assessment process which calls for achieving extensive local understanding, eliciting local expertise and engaging the public have proven to be powerful tools for adding detail to the potential impacts and avoiding conflict after a project is underway (Glucker et al., 2013). ICPGSIA emphasizes the importance of considering what counts, and not what is easily counted. By this the committee means that interacting with community members and gauging what is directly of concern to them can add to insights gained from analyzing standard statistical sources. Many "cultural impacts involving changes to the norms, values, and beliefs" are not quantified and require direct interaction with community members to be documented (King, 2000). Cultural resources include a broader range of elements than national register listed sites which sometimes are the sole focus of cultural resource assessments. Blending the qualitative, such as interviews and community forums, with the quantitative (analysis of demographic and economic data) magnifies understanding of the local situation (see appendix for additional details). Qualitative methods enable researchers to effectively field test conclusions drawn from quantitative methods, and also to suggest analytical approaches based on local concerns. Inclusion of local knowledge is in line with the Master Plan's participatory process.

C. Geographic and temporal scales that adequately encompass the range of social impacts

Two related issues that are particularly pertinent to coastal restoration efforts in Louisiana are the geographic and temporal dimensions. Diversions have the potential to impact parishes and populations other than the ones where the actual structures will be built. The proposed Mid-Barataria sediment diversion, for example, may impact fishing communities in Plaquemines, Jefferson, and Lafourche parishes. Consequently, an SIA must consider the entire spatial reach of the socioeconomic influences. In terms of the temporal scale, it is essential to keep in mind that social impacts can occur before construction begins. The announcement of a project can give rise to a social response. Thus, the social impacts can begin long before construction and the SIA and planning/development processes need to include the pre-project influences and outcomes. Also, since the diversions and other restoration projects will be protracted processes and not temporally discrete projects, a viable SIA must consider the social impacts throughout the duration of the process. To fully encompass the timeframe, data collection and monitoring must accompany the projects announcement, continue through its initiation, and also track the effects of any mitigation efforts (see appendix for additional details).

D. Environmental justice considerations: race/ethnicity, income, and gender

President Clinton's Executive Order 12898 (1994) called on federal agencies to make environmental justice a part of their missions by identifying and addressing "disproportionately high adverse human health or environmental effects of its programs, policies, and activities on minority and low income populations" (Executive Order 12898). This executive order and subsequent implementation of environmental justice practices have set in motion standard procedures for assessing the uneven impact of government actions on different populations that include a strong community/tribal participation and community/tribal representation process (Bass, 1998; Walker, 2010). Community engagement complements the quantitative component of an environmental justice analysis (see appendix).

E. Economic considerations: "PIES" – Property, Income, Employment, and Stakeholders

In addition to the environmental justice economic issues and standard cost-benefit analysis, an effective SIA considers the impact on property values, income levels, and employment opportunities for a full range of stakeholders (PIES) in the impacted area. Consideration should be given to pre-existing

conditions and trends and any alteration to those conditions and trends caused by the project/policy/program. Property values may decline in a scenario without action and the potential change in values needs to be analyzed. Consideration of PIES effects should be in addition to, and not seen as replacing, the conventional economic assessment of the costs and benefits of a project, program, and policy (see "consideration of the trade-offs" below, and appendix for more details).

F. Full exploration and communication of uncertainties

As part of the public outreach element of an SIA, the project team needs to provide stakeholders with information about the uncertainties associated with the project/policy/program. Projecting future impacts—both in terms of biophysical and social dimensions—has inherent uncertainties. Exploring and communicating these uncertainties will ensure that stakeholders are adequately informed about this reality. The Master Plan explicitly calls for an accounting of uncertainties (CPRA, 2012, 47).

G. Consideration of the trade-offs with the proposed project

Proposed projects will produce both losses of existing opportunities and the creation of new opportunities. The SIA should reveal as much as possible about the gains and losses (i.e., benefits and costs) associated with the pending project/policy/program as part of the projection of economic, social, and cultural impacts to different communities. Exploration of multiple scenarios and the uncertainties will help reveal what the trade-offs are. By noting the trade-offs, stakeholders will have a better understanding of who benefits and who loses, and if the project ultimately will provide more benefits than losses.

H. Social conditions with and without the projects

Although the emphasis of an SIA tends to be on a project's social impacts, a fundamental component of an EIS is to consider the alternatives. This would include conditions without the project/policy/program, along with other realistic options. This is particularly pertinent in coastal restoration projects. Since the Louisiana coast is a highly dynamic setting, there will be inevitable environmental changes even without the restoration work, and stakeholders need to be informed of these biophysical changes and how they may impact coastal communities. A thorough accounting of social conditions with and without the projects is needed as part of the SIA and parallels the Master Plan's procedures.

SIA WORKPLAN: SOURCES AND METHODS

The selection of quantitative and qualitative information sources needs to be driven by the methods, and there is an abundance of social and economic data available that can be supplemented with community input (see appendix for more detail). However it is also important to incorporate local stakeholder knowledge early in the process. The methods for developing an SIA can be separated into pre-project and post-project monitoring phases.

ICPGSIA presents an eleven-step process in conducting an SIA (ICPGSIA, 2003). These steps are to:

1. Develop a public involvement process;
2. Describe proposed action and alternatives;
3. Describe a relevant human environment and zones of influence;
4. Identify probable impacts;
5. Investigate probable impacts;

6. Determine the probable response of affected stakeholders;
7. Estimate secondary and cumulative impacts;
8. Recommend changes in proposed action or alternatives;
9. Develop mitigation, remediation, and enhancement efforts;
10. Develop and implement monitoring;
11. Report preparation and delivery.

The proposed work plan breaks the process into two stages: pre-project and post-project. The intent is to incorporate the established eleven steps process outlined above (ICPGSIA, 2003) into the following tasks while building on experience gained through the 2012 Master Plan process and extensive knowledge of working in coastal Louisiana.

PRE-PROJECT TASKS

The following pre-project tasks are not necessarily sequential and should run parallel to one another and in conjunction with the biophysical assessment that is underway for any particular project and will be taking place parallel to the SIA research. An example timeline is provided later in this report.

Task 1: Public participation

It is important to begin the public participation as early as possible. The impacts to society begin with announcements of proposed projects and not with the arrival of construction crews or the completion of a project. Public participation will include the parishes that surround Barataria Bay and stand to encounter impacts: Plaquemines, Lafourche, and Jefferson.

a. Interviews, surveys, and mapping exercises. As part of the participatory process, targeted interviews will be carried out. Interview subjects will be identified with the cooperation of local gatekeepers (e.g., Sea Grant Agents, NGOs such as Catholic Charities, and other informed and trusted local authorities) as an efficient way to tap local expertise and to involve representatives of local stakeholder groups. Open-ended interviews should be conducted following a snowball sampling technique that will enable researchers to move beyond the gatekeepers to include the full range of community stakeholders. About fifty unique interactions with residents and resource users are projected for each parish in the study area. Interviews will seek to gather local opinions about the impacts (positive or negative) that will follow the diversion and will identify differential impacts on different social groups, with environmental justice considerations in mind (Glaser & Strauss, 1967). The interview process ensures that the SIA is locally sensitive, technically credible, and legally defensible (ICPGSIA 2003). Interviews provide the principal method to assess the "things that count, but that are not counted." In particular, this pertains to norms, values, and beliefs that are not tabulated in secondary data sources. A key objective will be to uncover possible responses to the impacts. Prior to conducting the interviews, the Water Institute will secure IRB (institutional review board) approval.
b. Interviews will be recorded and the contents coded for subsequent analysis. The key themes of participants will collected and prioritized according the frequency of the comments and also weighted in line with environmental justice criteria.
Estimated duration: 7-8 months

Task 2: Describe proposed action and alternatives

a. The SIA team will review the project plans and identify locations where the proposed action will

occur. The SIA team will establish and map the complete project footprint, including activities occurring at all stages of project development, from construction through implementation and operation. As part of this review, the SIA team will also map the location of all associated project infrastructure. In consultation with the biophysical/hydrological EIS team, the SIA team will review the anticipated outcomes of the proposed action and determine the influence area of the proposed activity.

b. Reasonable alternatives will also be described in this phase. These should include both geographical (i.e. the location where the diversion is located) and structural (i.e. the rate of flow through the diversion) alternatives to the proposed action.
Estimated duration: 3 months

Task 3: Describe relevant human environment and zones of influence

a. Based on the biophysical findings from Task 2, the SIA team will carry out a spatial analysis of human activities and biophysical impacts to identify the zones of influence of the proposed project. This analysis will utilize a basic geographic information analysis of zones of natural resource procurement (both commercial and sport), areas of flood risk, and other human environment related activities in order to allow a description of the distribution of influences. This phase will consist of a community profile built on secondary data sources plus insight gained from the public participation (Task 1).
b. Analysis of local social and economic data can reveal baseline information and also pre-existing trends. Sources such as the U.S. Census, FEMA HAZUS, County Business Patterns, LSU AgCenter Agricultural and Natural Resource Summary, and NOAA fisheries landings constitute key sources for local socioeconomic conditions and trends. These sources enable the assessment of economic activity, social-demographic/environmental justice patterns, the employment situation, and income levels. Additional real estate and property tax information, available at the local level, can inform the "property" component. The potential for property value to increase or decrease either with or without implementation of the project should also be incorporated.
Estimated duration: 4 months

Task 4: Identify probable impacts

A fundamental component of an EIS is to consider the social, cultural, and economic character of a locale with and without the project, both at the time of the study and into the future. Consequently, the SIA must account for the social ramifications of the communities within environmental reach of the project, both with and without the project. Determining the social ramifications are the ultimate goal of the SIA and include, among other things, damage to natural resource-based economic practices, closure of social institutions such as churches and schools if people leave the area, loss of traditional culture if resource-based livelihoods disappear (see appendix for more detail).

a. Based on the community profiles the SIA team will examine impacts to property values, income levels, the local economy, and stakeholders. This analysis will draw on property records and secondary social and economic data, along with information gathered through community participation.[2] This work will use data collected by the SIA team for other Tasks and will draw

[2] This work will be conducted by an economist with expertise in coastal Louisiana and economic impact assessment who has yet to be identified. If the work plan moves forward Institute staff will consult CPRA prior to selecting the expert.

on projections of biophysical impacts to determine both negative and positive impacts.

b. An adequate accounting of socioeconomic impacts needs to include the value of ecosystem services, that is, benefits provided by natural systems (Barbier, 2011). As noted by the 2012 Master Plan, it is imperative to take into account both loss and enhancement of services such as the availability of commercial fisheries, coastal wildlife, and storm surge protection. Such changes in the value of ecosystem services, or benefits, should also be compared to the overall costs of the project/program/policy and considered as probable impacts. Ecosystem services analysis will be conducted by a consulting economist with expertise in coastal Louisiana. This work will use data collected by the SIA team and will draw on projections of biophysical impacts developed by the team carrying out that component of the investigation.

c. In consultation with the biophysical/hydrological research team, the SIA team will review the potential environmental impacts and cross tabulate these with the various stakeholders to identify which members of communities will encounter either positive or negative impacts. In addition, there should be an assessment of the overall gains and losses (e.g. benefits and costs) across all stakeholders. In other words, increasing sediment loads in the marsh may impact oyster leases, but may have a positive impact on shrimping in the long run. Will the diversion enhance sport fishing, and thereby potentially boost business at marinas? Will the potential gains to sport fishing and shrimping activities outweigh any potentially negative impacts on oyster fishing? The impact assessment should also factor in environmental justice considerations; will the impacts be felt unevenly among different income levels, race/ethnic communities, or between genders? During this step, the SIA team will develop matrices of variables, with and without project and alternative scenarios. This step will enable a comparison of the social changes estimated for the proposed action and each reasonable alternative (NMFS 2007).

   Estimated duration: 5 months

Task 5: Investigate probable impacts

The SIA team will expand its investigation of specific prioritized impacts by interviewing fisheries managers, natural resource managers, and various informed stakeholders to establish the relationship between biophysical impacts and natural resource based activities. They will then examine the ripple effect changes to the biophysical environmental will have on the economic/social situation, with particular attention to environmental justice considerations.

Estimated duration: 3 months

Task 6: Determine the probable response of affected stakeholders

Interactive community forums with stakeholders will enable the SIA team to present more detailed assessments of impacts and their relationship to specific groups. Community forums differ from interviews and involve convening groups of stakeholders (Becker et al. 2003; see appendix for methods). This task will seek responses to specific impacts.

Estimated duration: 4 months

Task 7: Estimate secondary and cumulative impacts (3 months)

a. Using scenario building techniques (Machlis & McNutt, 2010), the SIA team will explore the secondary and cumulative impacts with community stakeholders. Research of secondary literature on the impacts of environmental change on coastal communities will supplement the findings from the community. Based on the findings and the local socio-economic data,

estimates of secondary and cumulative impacts will be developed.

b. An effective SIA should report on areas of uncertainty in both the biophysical aspects of a project and the socioeconomic components. Given the imprecise nature of social predictions, stakeholders are entitled to transparency in terms of the gaps in data used to make projections and also the influences of uncertainty in the SIA outcomes. The 2012 Master Plan includes accounting for uncertainty as fundamental to the process of coastal restoration and protection.
Estimated duration: 3 months

Task 8: Recommend changes in proposed action or alternatives

Not only is it essential to consider the direct and indirect impacts, but the SIA should provide stakeholders with the range of trade-offs that follow from life with and without the project. This step should seek to reveal what sacrifices may be required, and also what benefits may follow the project's completion. This step may also recommend alternatives to reduce the anticipated social impacts resulting from the proposed action. A review of coastal adaptations to environmental changes and community participation information will inform this task.

Estimated duration: 2 months

Task 9: Develop mitigation, remediation, and enhancement efforts

An SIA should seek to identify means to mitigate adverse impacts. This may involve taking actions to avoid a specific impact, reducing an impact, rectifying an impact, or compensating those impacted. Avoidance and reduction can be achieved by modifying the plan before action is taken. Reduction can also be achieved by making adjustments to the project after its initiation, such as altering flow in a diversion. Compensation is a less desirable mitigation, but has been used. Voluntary compensation is listed in the Master Plan as one possible procedure. A key to effective mitigation is identifying "irresolvable" social impacts and taking steps to avoid them from the outset. Uncovering impacts that could instigate opposition or conflict requires community participation.

Based on the impacts revealed and the alternative actions, the SIA team will review options for mitigation, remediation, and enhancement. In consultation with local stakeholders, Institute staff will prepare a plan for mitigation, remediation, and enhancement.

Estimated duration: 2 months

Task 10: Develop and implement monitoring

Monitoring would begin at the outset of the public participation process. All interviews and community forums would serve as baseline information, along with the secondary socio-economic data. The SIA team will monitor changes in public attitudes and perception of the diversion project through the on-going coding and analysis of interviews. The assessment of public attitudes in the initial phase of research provides important insights into the public awareness of the project and how its announcement and public engagement are received. In addition, fisheries landings, county business pattern data, and census information would be tracked to identify impacts. Post-project monitoring should continue at least 24 months after construction on the project begins. The longer-term monitoring will entail tracing changes to the economic and demographic indicators used to project impacts. Ideally monitoring should be a perpetual process, but we propose two years as a period of active monitoring. The monitoring will examine changes in marginalized populations, key economic sectors, property values, and stakeholders to determine if the projected impacts are occurring and if other impacts have occurred. Secondary demographic and economic indicators will be used.

Estimated duration: 2 months + 24 months monitoring

Task 11: Report preparation and delivery

The SIA team will prepare quarterly reports (qr) and submit a final Social Impact Assessment 12 months from initiation of the project. The report will include a discussion of each of methods used and the conclusions in terms of the following points: (1) environmental justice issues with minority or low income users in the basin, (2) an undue economic burden on specific stakeholders from action compared to a future without action, (3) the economic viability of specific communities compared to a future without action, (4) the economic effects of action on specific fishing industries (e.g., oysters, shrimp) on a basin or coast-wide scale, (5) related social impacts commonly addressed in social impact assessments, and (6) community engagement in the Environmental Impact Statement (EIS) process.

Estimated duration: 3 months

POST-PROJECT TASKS

Monitoring is a fundamental component of an SIA and is justified in Louisiana coastal restoration projects for several obvious reasons.

1. Diversions will not be discrete projects with clearly defined end dates. They will produce results that are slow-paced and cumulative. Consequently, post-project monitoring should begin with the completion of the structural component and continue throughout the duration of the termination of the structure's use.
2. The Master Plan calls for adaptive management and monitoring of projects that is essential for this process to function and to guide adjustments to a project and the Master Plan.
3. Monitoring can target specific elements of a project and provide essential data to assess both its biophysical and social impacts and thereby guide the development of future SIAs and subsequent projects.
4. Monitoring, particularly of social impacts, is critical to political acceptance of a project and future projects.

Monitoring enables the detection and continual observation of changes in the socioeconomic patterns revealed by the secondary data. Based on the adjustments in the socioeconomic patterns, follow-up interviews with key informants will reveal more fine-grained social and economic impacts. Both quantitative and qualitative sources should be analyzed with environmental justice considerations in mind. Additionally, informants can speak to adaptations made at the local level. This is a vital element since Louisiana's coastal residents have persisted because they have adapted, and adaptation is something to be expected with the environmental changes that follow diversion projects. Adaptation is also a fundamental principle of the Master Plan.

Monitoring observations should be used to guide adjustments in the diversion project itself, to identify social benefits and costs of the project, and to provide input toward reducing uncertainty associated with a given project.

Estimated duration: 24 months

SIA WORKPLAN: TIMELINE

The following timeline is proposed for conducting an SIA for the Mid-Barataria diversion. An effective SIA depends on reliable projections of biophysical impacts and must be carried out in close consultation with those modeling hydrological, ecological, and physical geography impacts. Consequently, the timing of the SIA's launch and the individual tasks hinges on the progress of the biophysical modeling. While much of the data collection, public participation, and analysis can proceed independently, the final social and economic impacts can only follow the projection of biophysical impacts. The timeline proposed below assumes that necessary biophysical information is available by the end of month 2.

Activity/Task	1	2	3	4	5	6	7	8	9	10	11	12
1. Public participation		■	■	■	■	■	■	■	■			
2. Describe actions/alternatives	■	■	■									
3. Describe human environment	■	■	■	■								
4. ID impacts			■	■	■	■	■					
5. Investigate impacts						■	■	■				
6. Determine responses			■	■	■	■						
7. Estimate secondary impacts						■	■	■				
8. Recommend changes/alternatives									■	■		
9. Mitigation, remediation, alternatives									■	■	■	
10. Monitoring	■	■	■	■	■	■	■	■	■	■	■	■
11. Report preparation and delivery			QR			QR			QR	■	■	R

POST-PROJECT ASSESSMENT (ON-GOING)

Adjustments to projects implemented through the adaptive management process as specified in the Master Plan. This process will involve interaction with agency personnel, researchers doing the biophysical investigations, and local stakeholders. It will be adapted to the local situation and the project.

ESTIMATED BUDGET

Activity/Task	Estimated Budget
1. Public participation	$95,000
2. Describe actions/alternatives	$27,500
3. Describe human environment	$26,500
4. ID impacts	$221,050
5. Investigate impacts	$32,000
6. Determine responses	$26,000
7. Estimate secondary impacts	$15,800
8. Recommend changes/alternatives	$26,500
9. Mitigation, remediation, alternatives	$26,500
10. Monitoring	$10,000
11. Report preparation and delivery	$24,150
Subtotal	**$531,000**
Project management	$16,360
QA/QC	$2,970
Travel and equipment	$7,600
TOTAL	**$557,930**

SUMMARY OF SIA ESSENTIALS

1. A thorough SIA is essential for meeting legal and political requirements associated with coastal restoration projects. A thorough SIA will take into account not only economic impacts, but social, cultural, and environmental justice considerations.
2. An effective SIA will include both a thorough pre-project assessment and post-project monitoring and mitigation.
3. The minimum timeline for a viable SIA is one year following the award of the contract. At least three years are recommended for the full SIA, including monitoring and mitigation. For diversions, which by design take years to accomplish their objectives, long-term monitoring is advised.
4. Local knowledge/participation is essential for an SIA to be effective and viable.
5. The pre-project SIA should include impacts with and without the project.
6. The SIA should include early and continuing integration with the biophysical/hydrological modeling of the environmental impacts.
7. The SIA should provide adequate disclosure of scenario uncertainty.

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APPENDIX

PUBLIC PARTICIPATION METHODS

Interviews, surveys, and mapping exercises. This largely qualitative, public participation aspect of the SIA is intended to elicit patterns and trends of resource use and livelihoods, narratives of social and environmental change, and expectations of future change in relation to the project and several alternative scenarios. The research questions are: What is the pre-project 'baseline,' or: What do residents and resource users consider the most important existing conditions and processes of social and environmental change where they live, work, and play? What impacts, such as changes to social and political organization, are already being experienced in the project planning phase? What do people consider the spatial and social scope of the affected area? What potential positive and negative impacts do they identify related to the project? Who and where do residents and resource users expect to experience those impacts, how? How do residents and resource users evaluate the consequences of projected future impacts and for negative impacts, how would they mitigate or compensate for them? What metrics do people use to measure social and environmental change in their communities and how could those measures be integrated into the adaptive management of coastal restoration projects?

The fieldwork will employ multiple social science methodologies, namely demographic surveys/questionnaires, semi-structured interviews, mapping exercises, and preference sorting exercises of important species and preferred restoration strategies. These methods will be conducted with residents and non-resident coastal resource users and managers over several months. About fifty unique interactions with residents and resource users are projected for each parish of Lafourche, Plaquemines, and Jefferson. Participant recruitment will be done in consultation with key informants and gatekeepers such as parish, state, and para-statal government offices, NGOs, and professional and community associations, and through the researchers' direct engagement with people in the communities. Special attention will be paid to elicit the input of people from communities of special concern in SIAs including race/ethnicity, gender, socio-economic class, and/or utilization or management of affected resources. Examples of the above include African-American commercial oystermen and fishermen in Southern Plaquemines parish, Native American communities like Grand Bayou, and subsistence resource harvesters throughout the region. Engaging with the diversity of these social groups, like oyster leaseholders and non-lease holding oystermen, community residents who work in fisheries or in on-shore employment, and input from younger people and women as well as elders and men, will be one of our objectives. Seeking input from persons not resident in nearby communities but who may be affected through their use of affected coastal resources (like recreational and commercial fishers who live in New Orleans or Baton Rouge) will also be a matter of special attention. The SIA team will utilize biophysical and hydrological data on current and projected future conditions in Barataria Bay provided by the Water Institute in our interactions with research participants, such as mapping exercises.

A researcher with research experience in South Louisiana fishing communities and assessing the socio-economic impacts of the 2010 BP oil spill on coastal communities will be identified to lead the primary data gathering from residents and coastal resource users and managers in Plaquemines, Jefferson, and Lafourche parishes. An additional social science researcher with coastal expertise will also participate in the project design, fieldwork, and analysis, as will a graduate student who will contribute to fieldwork, data analysis, and write-up of the public engagement phase of the final report.

Interactive Community Forums. Water Institute staff will also conduct Interactive Community Forums in selected communities. The purpose of these forums is to provide community members with an

opportunity to provide input before the project is launched. They offer an efficient means to engage a larger body of community members than interviews and surveys, and they allow Water Institute staff to convey the ranges of options, the uncertainty in the alternatives, and to solicit input from the community of alternative strategies. These forums follow a format that allows for (1) presentation of basic information on the project, (2) community members can rate aspects of the project, the alternatives, or conditions without the project, (3) group discussion of the ratings, and (4) a final rating of options following the discussion (Becker et al., 2003).

Scenario-Building Workshops. Water Institute staff will carry out scenario-building workshops as part of its public participation that seeks to estimate secondary and cumulative impacts. Scenario-building workshops (Machlis & McNutt, 2010) allow stakeholders to consider various optional scenarios and consider the multiple potential "cascading consequences" as a way to consider both secondary and cumulative impacts. These workshops have different goals and methods from the community forums.

DATA COLLECTION AND ANALYSIS FOR METHODS 2-5

Identify social, cultural, economic impacts. A social impact assessment needs to identify the type, duration, spatial extent, and distribution of anticipated effects of major projects (Glasson 2001). The initial steps of the assessment involve developing local and regional baseline community profiles. Typically, these community and regional profiles include information on population and other demographic variables, economic and employment data, descriptions of social and cultural institutions, and an examination of social and economic capital distribution. The community profile establishes existing conditions and past trends associated with the human environment in which the proposed action is to take place (ICPGSIA 2003).

The social impact assessment should anticipate impacts at all stages of project development, starting with planning and continuing through construction and implementation and concluding with the operation and maintenance stage. The social impacts will be different at each stage of project development and not all social or biophysical impacts will occur at each stage (ICPGSIA 2003).
The community and regional profiles need to be updated regularly as a way of tracking the impacts of current management practices and to assure that planners have current baseline data when needed. NOAA suggests a timeframe of three to five years between updates unless significant regulatory or ecological changes have occurred (NMFS 2007). In the event that the project is abandoned or decommissioned, the social impacts need to be reassessed, assuming the baseline conditions had changed throughout the duration of the project lifetime.

Collection and analysis of secondary data. At the outset of the social impact assessment, a comprehensive list of all possible socioeconomic impacts and indicators will be developed. A combination of quantitative and qualitative methods is necessary to insure that all major potential project impacts on socioeconomic conditions are identified. A social impact assessment can include data from published scientific literature as well as primary and secondary data gathered for the affected area (ICPGSIA 2003). However, prior to developing and administering studies to collect primary data, researchers will determine whether secondary data sources already exist that may reduce or eliminate the need to collect primary data (Bright et al. 2003). The best secondary data sources available are the U.S. Census and vital statistics, geographical data, and routine data collected by state and federal agencies (ICPGSIA 2003). The Census is the most comprehensive secondary dataset available upon which to develop baseline conditions, gathering information about population and income distribution, employment by sector, education, housing type, and other social factors at the community, county, regional, and state levels. The Census data should be supplemented by information from relevant state,

county, and municipal entities. State governments, for example, maintain a significant amount of data about schools, health care, and public safety that are important in a social impact assessment (Bright et al. 2003). Parishes maintain property data.

We categorized the social, cultural, and economic variables to be analyzed under five general headings (Glasson 2001, ICPGSIA 2003):

- Economic (Direct and Indirect)
- Demographic
- Housing
- Socio-Cultural
- Community Resources/Local Services

The core of the social impact assessment is the prediction of social and biophysical effects of planned management decisions on the human environment. There are three broad categories of analytical techniques that can be employed in the assessment. The first uses historical time series data to extrapolate trends, identify patterns, and forecast probabilistic values. The second method examines relationships between variables to develop models and projections. Finally, qualitative projection techniques, such as scenario development and other expert opinion analysis techniques, can be used when there are few quantitative data available (NMFS 2007). Each of these techniques, taken separately or in combination, will allow us to anticipate changes to community and regional baseline conditions resulting from any number of land management alternatives.

As part of the social impact analysis, geographic information systems (GIS) will be used to display and visualize trends and patterns in the baseline datasets. Advanced GIS techniques will be used to analyze, query, and display many disparate social and biophysical data layers in order to support and inform the social impact assessment. Map overlays, buffering, cartographic modeling, and spatial query capabilities intrinsic to GIS will be used to determine the extent to which the impacts of proposed projects and the locations of vulnerable populations are spatially concentrated across a variety of different environmental parameters (Rodriguez-Bachiller and Wood 2001).

The SIA will be conducted at either the local or regional scale based upon the anticipated impacts and consequences to populations and institutions (IPET 2007). The level of demographic information from the Bureau of the Census that best defines human communities at the local level is that of the “place.” The Bureau of the Census recognizes two types of places; those that are incorporated municipalities and townships and those that are “census designated places” (CDPs), unincorporated communities with clear boundaries that residents and local officials can identify by name (NMFS 2007). If potentially impacted communities that reside outside of any CDP are identified, data from census tracts and/or block groups should be used (NMFS 2007). For regional level analyses, the study area should include impacted CDPs and areas adjacent to them, up to the parish or state level (IPET 2007).

Environmental justice analysis. No category of persons, particularly those that might be considered more vulnerable as a result of age, gender, ethnicity, race, or occupation, should have to bear the brunt of adverse social and biophysical impacts (ICPGSIA 2003). A social impact assessment should identify disadvantaged, at risk, and minority populations, describe the social and cultural characteristics of these populations, and incorporate this information into the baseline data sets (ICPGSIA 2003). Environmental justice impacts may be determined by comparing the racial, ethnic (including Hispanic and Native American), low-income populations in the project area to numbers in county and state populations. The social impact assessment should determine if the impacts of any proposed action on these populations

are disproportionate. The Department of the Interior suggests that if any of the differences in the categories are greater than 5 percent, the proposed project may be disproportionately impacting racial and ethnic minorities and low-income and, therefore, a potential exists for environmental racism or environmental injustice (U.S. Bureau of Reclamation 2001).

Table 1. Types of socio-economic impacts

1. Economic (Direct and Indirect)
    - Local and non-local employment
    - Characteristics of employment (e.g. skill group and industry)
    - Labor Supply and training
    - Wage levels
    - Community retail expenditures
    - Linked suppliers to main economic industry
2. Demographic
    - Changes in population size
    - Changes in population characteristics (e.g. family size, income levels, socio-economic groups)
    - Settlement and migration patterns
3. Housing
    - Housing stock
    - Housing tenure
    - House prices
    - Number of renters and owners
    - Vacant housing
4. Socio-Cultural
    - Quality of life/community well-being
    - Cultural landmarks (e.g. historical buildings, cemeteries, churches)
    - Educational attainment
    - Gender issues and family structure
    - Social problems (e.g. crime, illness, divorce)
    - Community stress and conflict
5. Community Resources/Local Services
    - Educational services
    - Health services
    - Access to local services (e.g. police, fire, recreation, transportation)

Adapted from (Glasson 2001, IPET 2007)