EXPERT PANEL ON DIVERSION PLANNING AND IMPLEMENTATION

Report #2

June 2014

Submitted to:
Coastal Protection and Restoration Authority

EXECUTIVE SUMMARY

The second meeting of the *Expert Panel on Diversion Planning and Implementation* focused on (1) the overarching need for articulating a conceptual model (for planning processes) of diversion outcomes and management endpoints, and (2) on recommendations to explore physical impacts of different diversion operation strategies, evaluate risk and uncertainty in ecological effects of diversions, and state inadequacies in social science research and analysis. Panel recommendations were developed from, and built upon, recommendations in the first Panel meeting.

1.0 INTRODUCTION AND BACKGROUND

The *Expert Panel on Diversion Planning and Implementation* (the Panel) held its second meeting in New Orleans on April 29-May 1, 2014. The Panel was established to provide expert advice and guidance on key issues that pertain to river diversions in recognition that diversions are an essential restoration tool in coastal Louisiana. Indeed, Louisiana's 2012 Comprehensive Master Plan states (p. 106) that "…sustainable restoration of our coast without sediment diversions is not possible". The Panel's official charge was thus to *provide technical input, review and guidance as plans are refined on diverting freshwater and sediment from the Mississippi and Atchafalaya rivers into adjacent estuarine basins to build, maintain and sustain coastal wetlands.*

The Panel, convened by The Water Institute of the Gulf (the Institute), is comprised of 12 members with backgrounds in a broad range of physical and biological sciences, social science, and engineering. The extensive experience of Panel members in other restoration programs, together with the particular blend of Panel expertise, was considered important for advancing our understanding of river diversions. The Panel recognizes that there is an expectation that they remain independent and objective, and that their role is advisory in nature. As such, the Panel is not in a position to make policy or implementation decisions. More information on the Panel, including the list of members and their professional expertise is included in Appendix 1.

The primary issues that the Panel will address over the next 2.5 years include: (1) evaluation of critical scientific and technical uncertainties; (2) identification of research that will be needed to reduce uncertainties; and, (3) review and comment on technical reports, model outputs, and other aspects of project development identified by the Panel or by the Coastal Restoration and Protection Authority (CPRA). The Panel anticipates that topics for consideration will vary from meeting to meeting and that the Panel will continue to be engaged in these topics between each of the formal meetings. The agenda for the first day of the meeting is given in Appendix 2. The second day of the meeting was not open to the public and the focus of those discussions is summarized briefly below.

2.0 FOCUS OF MEETING #2

The primary focus of the public part of the second meeting was to furnish background on the Mississippi River Hydrodynamics and Delta Management Study (MRHDMS) and to bring the Panel up to date on status of the Mid-Barataria Sediment Diversion. Prior to the meeting, The Water Institute arranged for a one-day field trip by seaplane and boat to the Barataria Bay receiving basin in the vicinity of Myrtle Grove. The overflight provided an opportunity to view the Mississippi River and surrounding wetland environments at an altitude of approximately 500 feet between Belle Chase and Fort St. Phillips. The trip aboard small vessels offered the Panel a first-hand look at both the high state of deterioration of the wetlands close to the anticipated location of the Mid-Barataria Sediment Diversion channel, and the status of the Lake Hermitage marsh creation project.

Much of the discussion in the closed part of the meeting was centered initially on the need by the Panel for a better understanding of how sediment diversions fit into the larger restoration planning process and how individual technical elements are effectively linked together and evaluated. As the meeting progressed, the Panel focused on three specific areas of interest: (1) exploring impacts of a range of diversion operation strategies with special emphasis on the planned Mid-Barataria Sediment Diversion, (2) assessing risk and uncertainty in the ecological effects of diversions, and (3) addressing the considerable shortcomings in social analysis. In the following recommendations, the Panel addressed expectations for the types of studies that should be conducted during the planning and design phase of sediment diversion projects: in particular, those that can realistically be achieved in 12-18 months with a focus on the Mid-Barataria Sediment Diversion.

Many of the findings and recommendations in this report evolved from the discussions of uncertainty at the first Panel meeting. Given the complexity of the science and engineering associated with the design and operation of major freshwater and sediment diversions, and that there are no analogues of existing sediment diversions at an appropriate scale, it became clear that uncertainty was a highly relevant and pressing topic for consideration. All of the recommendations in Report #1 are still relevant and our goal in writing Report #2 was to revisit and provide more detail about our previous general recommendations, placing most of them in a timeframe that will be useful for the major diversion at the Mid-Barataria site.

3.0 DISCUSSION, FINDINGS, AND RECOMMENDATIONS

The Panel identified and discussed at length four broad areas that need attention in the near future: (1) diversion outcomes and management endpoints based on a well-articulated conceptual model; (2) understanding physical impacts of various operation strategies based on modeling and data collection; (3) assessing the risk and uncertainty in ecological effects; and, (4) short- and long-term needs and considerations related to social analysis. We provide below a discussion of these along with a set of recommendations for each.

3.1 Conceptual Model: Diversion Outcomes and Management Endpoints

The 2012 Comprehensive Master Plan represents an important cornerstone for coastal restoration project planning. Understandably, because the Master Plan represents the earliest stage of restoration, it does not provide details on implementation of these projects, nor does it articulate the approach for planning sediment diversions. To provide sound and useful advice on the individual technical elements of the diversions, the Panel needs to better understand how each element fits into sediment diversion planning and the larger restoration planning process. The creation of a well-developed conceptual model of the planning process will also lead to in-depth thinking about the restoration program, aid in public discussion about likely outcomes, lead to identification of tradeoffs and unexpected outcomes, and show how components connect with each other.

Flow charts that show the conceptual linkages between the technical elements (environmental and socio-economic) of the diversion planning process offer an effective way to represent how project components will affect the delta and what outcome indicators will be evaluated. We recognize that presentation of such a conceptual model could be preliminary in nature and subject to further refinement based on experience and exchanges with the Panel.

A conceptual model of sediment diversion planning could easily take the form of a diagram showing suites of outcome indicators and their connections. These can include both bio-physical and socio-economic indicators, metrics, or performance measures that are the anticipated outcomes from diversions and their management. As with the conceptual model itself, we recognize that some technical elements will likely need to be further developed and therefore that CPRA in due course will be able to provide these indicators in great detail (e.g. changes in dredge volume and predicted thalweg depth in the main river as detailed in Dr. Meselhe's presentation on MRHDMS modeling activities). However, we also recognize that other indicators or outcomes may be less well defined. The conceptual model of outcome indicators and their connections is key information for the Panel to evaluate the maturity of thinking supporting the planning process.

In addition, the Panel would benefit from an understanding of the technical approach that will be used to evaluate each suite of indicators. This may include field studies, remote sensing studies, and modeling or qualitative or quantitative anthropological or economic methods. Access to support documentation where it exists for individual technical elements, particularly for scope of work and strategies, would be helpful for the Panel to evaluate. Finally, the Panel is interested in gaining a better understanding of what management options have been identified for evaluation through the technical analysis.

Recommendations:

1. **Articulate (at the Fall 2014 Panel meeting) an expanded view of the technical approach to be taken by CPRA and The Water Institute of the Gulf in planning for sediment diversions. The minimum content of this presentation should be a conceptual model that shows linkages among the technical elements and provides an overview of biophysical and socio-economic indicators or performance measures. For each suite of indicators, a brief description is needed of the technical approach and modeling to be used in the analysis.[Follow-on to Recommendations #1,#2,#3,#4,#6,#7,#8,#12, and #15 in Report #1].**

3.2 Hydrodynamic Modeling and Data Collection: Optimizing Diversion Operations

The Panel reiterates from our first report that data collection and hydrodynamic modeling within the Mississippi River has been comprehensive. Modeling approaches were diverse and ranged in complexity and timescale depending on their objectives (e.g. longitudinal river modeling versus full 3D hydrodynamic models). The consistency of outcomes within this model ensemble leads to confidence that the basic behavior of the system is understood and captured in the models. Data collection within the river was designed to calibrate and validate models and served that function. However, data collection also led to fundamental improvements in the understanding of sediment transport. For example, repeat measurements of water and sediment characteristics in a water parcel moving down river were not just useful for model calibration, but also novel contributions by themselves. Other important field-based contributions included the new understanding of bedload transport rates and fluxes, and sand bar formation and recharge regimes. Finally, modeling and data collection were well integrated. Comparisons between modeled and observed sand volume changes within the river and Bonnet-Carre spillway, for example, suggest that the models are capturing the important sediment transport processes over a range of timescales.

The Panel also notes that analysis of land building in the West Bay receiving basin was excellent, and modeling of the impact of sediment retention enhancement devices (SRED's) provided important information that can be used to evaluate interactions between diversion and dredge spoil restoration. Sediment transport modeling in the West Bay diversion was aided by detailed bathymetric and geotechnical data, and validated with multi-year observations of changes in sediment volume. We look forward to seeing the same scientific rigor applied to data collection, modeling, and analysis of the Mid-Barataria receiving basin. Particular attention should be paid to subsidence assessment as long-term geological estimates conflict with short-term leveling and tide gage measurements.

Speakers at the Panel meeting suggested that land building in natural deltaic environments is accomplished primarily in low frequency flood events, and that a diversion operation strategy centered on intermittent releases of freshwater and sediment could provide relatively brief sediment pulses without long-term impacts to salinity. Therefore, an important goal in the next 12-18 months should be to use multiple hydrodynamic and morphodynamic models to evaluate the impacts of diversion openings under various operation strategies. These simulations should focus on the duration and frequency of openings, and the potential tradeoffs between rates of land building and changes in salinity. Existing hydrodynamic models are well calibrated for the West Bay diversion and effectively replicate observed changes in land building rates. A logical next step would be to conduct a sensitivity analysis that explores a range of hypothetical West Bay operation strategies. Understanding how operation strategy influences land building and salinity in receiving basins is a critical knowledge gap that is fundamental to determining ecological and social outcomes.

Recommendations:

2. **Use hydrodynamic modeling and data collection to explore the physical impacts of a range of diversion operation strategies with particular attention to how the frequency and duration of diversion operation influences land building and salinity in a receiving basin. [Follow-on to Recommendations #1,#9,#10,and #17 in Report #1].**

3.3 Ecological Effects of Diversions: Assessing Risk and Uncertainty

Ecosystem modeling will be necessary to evaluate and understand the array of potential ecological effects of diversions on Louisiana estuaries. These models can provide critical links between hydrology and sediment models and the social and economic effects of diversions. There are legitimate concerns by many residents in coastal Louisiana that diversions will have detrimental impacts on their homes and livelihoods. A more proactive public process should be initiated to address these concerns, and these forums should be used to encourage public input into the development of ecosystem models. Only through such a community-based approach can public trust be engendered in the scientific modeling process.

Selecting and developing appropriate ecosystem models is complicated. Rose and Sable (2013, Strategy for Selecting Fish Modeling Approaches, 2017 Coastal Master Plan: Model Improvement Plan, CPRA, 122 p.) have fully explored the issues related to fish modeling. However, ecosystem modeling also must address other concerns such as the potential introduction of exotic species from river water, impacts to marine mammals and endangered species, changes in water quality, and effects on marsh elevation trajectories. There are several issues of concern:

(1) Ecosystem Risks. There is a need to identify the ecological risks and environmental concerns from the perspective of both resource agencies and the public. The outputs of ecosystem models need to be

closely linked to diversion management endpoints and to the concerns of people. Some of the concerns already identified include potential failure to build land and establish vegetation, extensive changes in salinity regimes, increased water levels and flooding, and excess nutrients and eutrophication. A major issue of economic and social significance is fishery impacts, and models need to address spatial distributions of fishery species, changes in species composition, and overall production. A major controversy and source of uncertainty in predicting the ecological effects of diversions is the effect of high nutrients in river water on marsh maintenance, evolution, and building. Understanding the interacting effects of changing salinity and nutrients simultaneously is not predictable based on current information. Other issues include effects on endangered species, marine mammals, and invasive species (e.g., Phragmites, Salvinia, water hyacinth, Chinese tallow, nutria, freshwater clams, grass carp). Invasive species are common in the freshwater wetlands of the Delta, and diversions are likely to enhance their spread. The potential for invasive species to undermine restoration goals should be addressed in model development and monitoring efforts.

(2) Multiple Models. A multiple model approach is needed to address ecosystem effects. For the same reasons that the United States Army Corps of Engineers (USACE) proposes more than one hydraulic and hydrology model, multiple ecosystem models can hedge against uncertainty and provide confidence in results (Rose and Sable, 2013). All modeling approaches have limitations representing reality, and a multi-model approach (e.g., developing independent EwE and CASM models) is important in determining the validity of forecasting outcomes. The mix of models also should include simple models that are easy to run and can examine expected effects on the distribution and production of individual species. More spatially articulate models that include many trophic groups can generally provide information on how a system works, be useful as learning tools, and provide general directions of change, but they often are not useful in making specific predictions.

(3) Linkages Among Models. Ecosystem models need to be successfully linked to physical and social models at appropriate spatial and temporal scales using a clearly articulated approach and integrating bio-physical feedbacks. Successful linkages generally occur when this aspect of modeling is considered as a central component of physical modeling from the beginning. Outputs of ecosystem models, particularly those related to fisheries production, need to be linked to social models that incorporate current fishing practices, and account for changes in fixed location fisheries such as oyster leasing and crab trapping. Fisheries need to be included in ecosystem models to make the link with socioeconomics.

(4) Role of Monitoring. All ecosystem models require extensive monitoring data for development, calibration, and validation. These monitoring data are also necessary to inform adaptive management of diversion operations and to assess diversion impacts, regardless of any modeling approach. Past and present monitoring of ecosystem components likely to be affected by diversions appears inadequate to understand temporal and spatial patterns of marsh accretion/loss and abundance and biomass of the biota. Changing salinity is a critical driver for any of these ecosystem models, and relationships between salinity and animal abundance and growth are unclear. The current monitoring program for juvenile nekton by the Louisiana Department of Wildlife and Fisheries (LDWF) provides a historical baseline for estuarine systems, but the spatial extent of sampling stations is limited, the gears used have inherent selection bias, and important aspects of biota are not being sampled. Of particular interest is the effect of changing salinity on vascular plants, phytoplankton, submerged aquatics, and benthic infauna (meiofauna, polychaetes and amphipods), because these ecosystem components support food webs.

(5) Model Selection. Important criteria for model selection should be adaptability and flexibility. Models need to be able to address questions that may not yet be envisioned and be modified to incorporate

changes in climate and sea level rise, effects of hurricanes, other coastal restoration strategies, various operational plans for diversion structures, and sociological concerns. For example, models should be able to simulate system effects if diversion structures were operated only during flood events, allowing system recovery during intermittent periods. The state change ecosystem response to a pulse event versus a sustained release may be substantially different.

(6) Whole Marsh Experiments. There is a pressing need to examine combined effects of erosion, nutrients, and salinity associated with diversions on Louisiana marsh structure and function. Whole ecosystem experiments conducted at a scale that contain the appropriate habitats, communities and processes would in the short term (next 2 years) provide parameters for ecosystem response models, and in the longer term (sustained for 5-10 years) provide examples of the potential variation in ecosystem response to Mississippi River diversions. For example, diking off areas of fresh to brackish marshes with appropriate habitats and geomorphology (5 to 10 hectares of open area, creek channel and marsh each, n=5 to 10 replicates) and pumping Mississippi River water at current velocities expected during a diversion and with nutrient levels (~1 – 3 mg/L NO_3^-), salinities (0 ppt) and sediment loads equal to the concentrations found in Mississippi River water combined with comprehensive monitoring of water, sediment and nutrient budgets, macrophytes and algal plant species, production and coverage, decomposition and biogeochemical processes (especially denitrification) and invertebrate, fish and bird species and ecosystem modeling would be of particular interest. [See 'Prairie Wetland Ecology: The Contribution of the Marsh Ecology Research Program by Henry R. Murkin; Arnold G. van der Valk; William R. Clark 2000 (ISBN 0-8138-2752-3) for a model program.

Recommendations:

3. **Provide the Panel with presentations of the ongoing ecosystem modeling efforts, including information from outside modelers using multi-model approaches. We would like to hear how the recommendations of Rose and Sable (2013) are being planned or implemented. [Follow-on to Recommendations #7 and #14 in Report #1].**

4. **Develop a review process with outside experts to examine the adequacy of available monitoring data to assess diversion impacts, develop and validate ecosystem models, and inform adaptive management. This review should cover the need for additional sampling of biological characteristics (e.g., phytoplankton, SAV, benthic infauna), rates of marsh accretion/loss in receiving basins, adequacy of gear presently used to sample juvenile fishery species, spatial and temporal coverage of sampling, and power analyses. The current CRMS sites provide valuable monitoring information, and their continued operation is encouraged. In sections of basins affected by diversions, the spatial coverage of CRMS sites should be expanded to help monitor both local and system effects. [Follow-on to Recommendations #1,#3,#6,and #8 in Report #1].**

5. **Conduct whole marsh system experiments to resolve some of the uncertainties underlying ecosystem risks and provide parameterizations for the ecosystem response models. Experiments should be conducted with water at current velocities expected during a diversion and at nutrient levels and salinities equal to concentrations found in the Mississippi River to understand the impacts of the combined effects of erosion, nutrients, and salinity on Louisiana marsh structure and function. [Follow-on to Recommendations #9 and #11 in Report #1].**

3.4 Social Science Analysis: Short- and Long-Term Needs and Considerations

The Panel has the sense that little or no social science or social analysis is underway connected to diversion planning or implementation. Accordingly, there is a need to quickly make progress on identifying the most appropriate and useful roles for social science and analysis in planning for diversions. We think that it is important for the Panel to be briefed on stakeholder perceptions about coastal and delta restoration. Such a briefing should yield three outcomes (or products): (1) a list of major perceived positive and negative impacts of diversions by stakeholder groups; (2) a "priority list" of key conflicts and tradeoffs arising from diversions as perceived by stakeholders; and (3) guidance for biophysical modeling that addresses potential perceived impacts, conflicts and tradeoffs of stakeholders (see Section 3.1 on modeling).

The content of the briefing to the Panel on stakeholder perceptions could be obtained in several ways. We leave determination of the precise approach to CPRA and The Water Institute. One suggested idea is to undertake a formal study of stakeholder perceptions, based on formal interview techniques and report on the findings. Another idea would be to ask a smaller set of particularly engaged stakeholders (from the NGO sector, business world, and local communities) to write up, or at a minimum present to the Panel, their priority lists or key concerns about impacts, conflicts, and tradeoffs.

It is clear that social science is most useful as a way to illuminate – or even help resolve – conflicts, tradeoffs, and potential impacts. If guided by stakeholder concerns, biophysical modeling can clarify potential impacts and outcomes from tradeoffs, and facilitate resolution of social conflicts. A social identification of conflicts and tradeoffs may have immediate and significant implications for the biophysical science to be conducted. Consider two examples:

(1) If the commercial or recreational fishing communities are concerned that freshwater pulses from diversions will lead to the geographic movement in, or decline of, species (the stakeholder concern) this suggests that delta modeling and the endpoints of that modeling should clearly reflect fish population effects and their geographic location and that those effects be linked to alternative diversion management scenarios (such as the frequency and duration of freshwater releases into the delta).

(2) If property owners in the delta are concerned about the effect of diversions on flood risks to property or communities (the stakeholder concern), then modeling emphasis should be placed on hydrological modeling of flood risks, their location, and potential magnitude. This concern, again, is tied to alternative diversion management scenarios.

Social science can take many forms and serve a variety of purposes. What experts, methods, data, and disciplinary perspectives should be engaged? How should specific stakeholder issues, conflicts, and tradeoffs be identified and examined? Answers to these questions will help guide future social science strategies. It is essential to understand how stakeholder groups are likely to be impacted by diversion projects. If respondents are opposed to or wary of diversion projects, what is the nature of the concern? Similarly, for those in favor, why do they think diversions will be beneficial?

Whatever social analysis occurs, we stress that its relevance and impact is dependent on a close coupling with physical and ecological modeling. Also, we emphasize that the kind of social analysis conducted depends on the specific questions to be addressed (e.g., science communication issues, monetary valuation of project alternatives, design of programs to compensate impacted property owners, developing and validating measurable indicators of human community resilience). A longer-term plan is needed to enable social science to contribute to diversion planning and evaluation and broader issues for coastal planning, resilience, and adaptation. The Panel recognizes that implementation of these plans will be a function of staffing and budget realities. However, we see a need to discuss capacity for data collection and social analysis at regional and basin-wide scales.

Recommendations:

6. **Develop a process to identify the most important conflicts, tradeoffs, benefits, and risks associated with diversions. This should be done soon by engaging with diverse stakeholders, including those who may oppose diversions. [Follow-on to Recommendations #12,#13,#14 and #15 in Report #1].**

7. **Link a longer-term social science research plan to key diversion questions and in a way that is closely coordinated with related biophysical analysis. [Follow-on to Recommendations #4,#6,#7,#8,#12,#14,#17 and #18 in Report #1].**

NEXT STEPS

This report, written as a stand-alone document, was built off the Panel's first report. All of the recommendations in that report (18 total, 7 high-priority) are still considered by the Panel to be relevant, and we recognize that CPRA is making significant progress in implementation. The recommendations in this report include those that should be addressed at the Fall 2014 Panel meeting (#1, #3), those that need to occur over approximately the next 12-18 months (#2,#4,#5,#6), and those that can be appropriately addressed in the 2-3 year time frame (#7). See Table below.

Recommendations (see text for full version)	Timeframe for Implementation
1. Articulate an expanded view of the technical approach in planning for diversions.	Fall 2014 Panel Meeting
2. Focus data collection and hydrodynamic modeling on optimizing diversion operation.	12-18 months (or less)
3. Provide presentations of ongoing ecosystems modeling efforts.	Fall 2014 Panel Meeting
4. Develop a review process to examine adequacy of monitoring data.	12-18 months (or less)
5. Conduct whole-marsh experiment to understand impacts of combined effects of erosion, nutrients, and salinity.	12-18 months (or more)
6. Develop a process to identify conflicts, tradeoffs, benefits and risks associated with diversions.	12-18 months (or less)
7. Link longer-term social science research to key diversion questions.	2-3 years

Appendix 1:

ABOUT THE EXPERT PANEL ON DIVERSION PLANNING AND IMPLEMENTATION

The Expert Panel on Diversion Planning and Implementation was established to provide independent advice as plans for implementing sediment diversion projects along the Mississippi and Atchafalaya rivers that support coastal restoration are refined.

This independent panel is expected to meet approximately three times per year. It will identify critical scientific and technical uncertainties, suggest specific research to reduce uncertainty, and review and comment on technical reports, model outputs, and other aspects of project development. Given the issues surrounding the complexity of the design and operation of a major sediment diversion, the panel's recommendations will be in an adaptive management context. Meetings of the panel will be structured to ensure key input is received from a variety of local experts, stakeholders, and citizens. Panel reports will be presented at meetings of the CPRA Board.

The Expert Panel was formed at the request of CPRA, which is also funding the effort. The Water Institute of the Gulf provides staff and logistical support to the panel.

MEMBERS

Member	Affiliation	Expertise
Dr. John T. Wells	Virginia Institute of Marine Science (Panel Chair)	Deltaic Processes
Dr. Loretta Battaglia	Southern Illinois University	Restoration Ecology and Climate Change
Dr. Philip Berke	Texas A&M University	Urban Land Use and Environmental Planning
Dr. James Boyd	Resources for the Future	Economics and Environmental Policy
Dr. Linda Deegan	Marine Biological Laboratory	Fish Ecology, Biogeochemical Cycling and Nutrient Delivery
Dr. William Espey Jr	Espey Consultants Inc	Civil/Coastal Engineering and Water Resources
Dr. Liviu Giosan	Woods Hole Oceanographic Institution	Morphodynamics and Sedimentation
Dr. William Graf	University of South Carolina (Emeritus)	Rivers and Water Resources Management
Dr. Matt Kirwan	Virginia Institute of Marine Science	Coastal Landscapes and Sea Level Change
Dr. Tom Minello	NOAA Southeast Fisheries Science Center	Fisheries Ecology
Dr. Martha Sutula	Southern California Coastal Water Research Project Authority	Water Quality Management, Systems Ecology
Dr. John Teal	Woods Hole Oceanographic Institution (Emeritus)	Coastal Wetlands Ecology

Appendix 2:
MEETING #2 AGENDA

April 30, 2014
Lindy Boggs Conference Center, Room 256
University of New Orleans

8:30	Welcome and Panel Introductions Review Agenda	Dr. John Wells (Panel Chair) Virginia Institute of Marine Sciences
8:50	Opening Remarks	Mr. King Milling Chair, Governor's Advisory Commission on Coastal Protection, Restoration and Conservation
9:00	Diversions Update	Mr. Kyle Graham CPRA
9:45	Introduction to the Mississippi River Hydrodynamic and Delta Management Study (MRHDMS)	Dr. Barb Kleiss USACE
9:55	MRHDMS Data Collection	Dr. Mead Allison The Water Institute
10:30	MRHDMS Geomorphic Assessment	Dr. Charles Little and Dr. David Biedenharn USACE/Biedenharn Group
10:50	MRHDMS Modeling	Dr. Ehab Meselhe The Water Institute
11:25	Wildlife and Fisheries Response to Existing Freshwater Diversions	Mr. David Lindquist CPRA
11:55	Lunch	
1:00	Approaches to Social Impact Assessment	Dr. Craig Colten The Water Institute
1:30	Mid-Barataria Sediment Diversion	Ms. Micaela Coner and Mr. Bob Beduhn CPRA/HDR
2:30	Break	
2:45	Panel Discussion Panel will present and discuss with the Expert Panel their opinions regarding appropriate project-specific analysis for large scale sediment diversions	Dr. Robert Twilley LSU Dr. Sherwood 'Woody' Gagliano Coastal Environments, Inc. Dr. Margaret Reams LSU Dr. Megan LaPeyre USGS
4:00	Public Comment Period	
5:00	Adjourn	