Achieving Resilience in Coastal Communities

Resources and Recommendations

August, 2014

RESTORE THE MISSISSIPPI RIVER DELTA

NATIONAL WILDLIFE FEDERATION

Guided by the Past, Looking to the Future

Coastal Louisiana is home to people from all over the world. But no matter where they come from and where they live now, there is one set of challenges that all coastal residents must confront. From land loss and subsidence to flooding, those living and working in south Louisiana are facing a constantly changing landscape. Just the predicted effects of climate change alone are daunting: stronger and more frequent storms, rising sea levels, and changes in rainfall patterns, to name just a few. As they look to the future, coastal residents are looking for common sense tools to help them adjust. This document and its appendices were prepared with the needs of coastal residents in mind.

Our goal in producing these documents is to explore ways that citizens, business owners, and local leaders can increase their safety and resilience in the coming years. Our recommendations assume partnerships among these stakeholders and Louisiana's Coastal Protection and Restoration Authority (CPRA). In this spirit, this document's recommendations were designed to complement the state's 2012 Coastal Master Plan, as well as the CPRA's ongoing efforts to quantify coastal flooding risk.

However, our recommendations work at a different scale than some of the larger projects proposed in the state's plan. For example, we did not consider measures related to levee building. Such projects require decades of political maneuvering and congressional appropriations of billions of dollars. Communities need answers now, and so we focused this document on measures that citizens and communities could undertake right away, such as comprehensive land use planning, public education, and floodproofing.

The terms "nonstructural measures" and "hazard mitigation" are often used to describe this category of activities. Our report and appendices use these terms, but, when appropriate, we also frame the challenge as one of climate change adaptation. Together, these terms encompass a range of options that can support effective action.

Communities in coastal Louisiana have a long history of adapting to changing conditions. For hundreds of years, Louisiana's coastal communities were built to withstand frequent floods, creating a culture that was uniquely suited to the challenges of living with water. This history needs to guide our future, and we have used the lessons Louisianans learned in the past to guide our thinking about the challenges facing us today.

Appendices to This Report

- **A.** Introduction to Nonstructural Measures
- **B.** Developments Related to Nonstructual Mitigation in Coastal Louisiana
- **C.** Legal Issues
- **D.** National Sources of Funding and Technical Assistance
- **E.** Resources for Communities
- **F.** Sponsors of Nonstructural Activities
- **G.** Research Conducted for the National Wildlife Federation Study
- **H.** Study Results
- **I.** Bibliography

Check Out:

Chart on p. 6 of Appendix A-1 that provides pros and cons of structural and nonstructural measures.

Fact sheets on p. 2 of Appendix A-3 that summarize national success stories.

Explanation on p. 3 of Appendix B-1 that explains Louisiana's wetland loss crisis and how this, in combination with climate change, has spurred the need for innovative land uses.

Discussion on p. 5 of Appendix C, which provides specific legal cases supporting innovative land use policies.

Matrices in Appendix F that show which organizations are working together to support adoption of nonstructural measures and which are not. Use the zoom in feature to make the document easy to view.

Findings on p. 4 of Appendix G, which summarize the major themes of our in depth study of coastal parish attitudes toward nonstructural measures.

Table on p. 4 of Appendix H-2, which shows which parishes are participating in the National Flood Insurance Program compared to parishes participating in the Community Rating System.

Extensive bibliographic section on p. 39 of Appendix I that summarizes key findings on risk communication from the National Hazards Center.

A Study of Coastal Parishes

Coastal Louisiana is not alone in facing an uncertain future. Many organizations and researchers throughout the world work on these issues and have generated a huge number of options for communities to consider. The availability of so many measures, each with different requirements, can be confusing for a family or community trying to find the way forward.

At the same time, the residents of Louisiana's coastal communities know the conditions they are facing better than anyone. To learn how we could support them in creating options tailored to their needs, the National Wildlife Federation sponsored a year long study of coastal Louisiana tools, projects, and attitudes toward nonstructural adaptation measures. The study was conducted by the National Hazard Mitigation Association and led by Alessandra Jerolleman. Appendices G and H present the methods and results of this study.

As the study progressed, several themes emerged (see Appendix A-2):

- Some coastal communities are adopting nonstructural measures, providing models that can be useful for other regions. However, most coastal residents surveyed are unaware of or resistant to adopting nonstructural measures that are not federally subsidized. Because it has been federally promoted and subsidized in this way, our researchers suggest, residential home elevation is the most popular nonstructural measure in the study area.
- Other measures, such as floodproofing, land use planning, relocation, building code adoption, or code enforcement are seen not as steps a community can take in advance to lessen future impacts, but as steps to be taken in reaction to a disaster.
- A strong local focus on large and costly levees places the responsibility on government agencies for adapting to rising seas and more frequent storms.
- The hidden costs of unwise development and over-reliance on structural measures often go unrecognized until a community experiences a large flood or catastrophic levee failure. Progress requires that we develop a truer understanding of these costs, as well as the benefits and avoided costs gained as a result of proactive adaptation.
- Accurate information regarding the costs of unwise development can be a powerful tool for local officials who wish to reduce future losses. Coastal residents can also make more informed decisions if they have access to information that supports a more accurate understanding of the likely future impacts of coastal land loss, subsidence, and climate change. Residents also need information about the costs and benefits of various adaptation measures.

Practical Implications of the National Wildlife Federation Study

The study's results highlight the need for improved information about what current risks are and how to reduce them. However, the results also suggest that information alone will not spur people to action. Adopting nonstructural measures requires businesses and households to spend resources in unfamiliar ways. Louisiana residents may be more willing to do so if they better understand their options and how they can receive help as they make changes.

Incentives and coordination of resources, the study results taught us, will be crucial. In many cases, this will mean gaining a more complete understanding of the local and state resources already available, including nongovernmental organizations, private sector initiatives, and the work of individuals. The creative use of these resources, in addition to federal programs, will help nonstructural measures gain a greater foothold in coastal Louisiana.

More widespread adoption of nonstructural risk reduction measures will become increasingly important to coastal Louisiana in the context of flood insurance. While portions of the Biggert-Waters Flood Insurance Reform Act of 2012 have been repealed, flood insurance premiums will continue to rise over time. In addition, Congress must reauthorize the National Flood Insurance Program in 2017 and has signaled a desire to put the program on a more financially sustainable path. By adopting nonstructural measures prior to reauthorization, businesses and homeowners can reduce both their risk and their flood insurance premiums.

Supporting Action: Criteria for Recommendations

Louisiana's 2012 Coastal Master Plan proposes a $10.2 billion budget for nonstructural protection measures over the next 50 years. We are pleased that the Master Plan addresses both physical measures, such as floodproofing, and programmatic measures, such as land use planning and ordinances. Still, although the master plan's Appendix F2 contains a number of recommendations for moving forward, it is time to move beyond broad statements of intent and begin taking specific and targeted action.

Working within the framework established by the state and using the conclusions of our study as a guide, we developed a set of recommendations for the state and its partners as they implement Louisiana's nonstructural program. In developing our recommendations, we chose approaches that met the following criteria:

- Rapid results. The threats facing coastal Louisiana are affecting people's lives today. Our recommendations must address these short-term impacts and contribute to greater resilience within three to five years.
- Comprehensive approach. Nonstructural measures will be implemented as part of the larger state program of wetland restoration and protection. Community wide action should enhance safety, quality of life, and the overall resilience of the community and the coast. In the same way, the activities we recommend must be compatible with the state's coastal program.
- Meaningful stakeholder involvement. Community members must be involved in gathering information, generating solutions, and making the decisions that affect their homes and lives.
- Unique solutions for unique places. Specialized strategies will be needed to protect this region, with its varied and intensive uses. In order to customize community plans, we must understand community needs today as well as the lessons of the past.

Recommendations

Recommendation: The Coastal Protection and Restoration Authority (CPRA), through its Coastal Community Resiliency Advisory Committee, should collaborate with coastal communities to design customized hazard mitigation plans and specific recommended actions for implementation.

The CPRA is the state entity responsible for addressing Louisiana's coastal crisis. Together, the CPRA's committee and selected communities should consider options for funding and technical assistance, creating plans tailored to the unique needs of the communities' residents, landscapes, and economies. These communities would gain the tools they need to implement nonstructural measures, while providing the state with information about how nonstructural programs could be assembled and adapted to other coastal areas. Such an approach would involve:

- a professional structure for the committee (e.g. groundrules, meeting summaries, strong facilitation);
- established criteria for selecting communities (e.g. ability of communites to serve as models, options for using innovative technology, potential of resulting plan to support the master plan);
- a workshop format to help community residents and committee members work together toward focused goals;
- use of experts to highlight new data and innovative options;
- an ongoing record of results published in easy to understand documents and web materials;
- an expedited timeline for completion of at least three community plans within nine to 15 months.

Options to Consider When Building Community Plans

- adoption of No Adverse Impact Standard
- elevation above flood of record, if necessary
- participation in Community Rating System
- establish line item in local government budgets for nonstructural measures
- use of vouchers to help low-income residents purchase flood insurance
- use of local freeboard requirements
- conduct watershed based reviews of development activity
- provide increased support for evacuation
- See Appendices D and E for other options, including federally funded programs.

Recommendation: The CPRA, through its Coastal Community Resiliency Subcommittee, should coordinate the state agencies responsible for implementing nonstructural measures and play a lead role as state and federal policies evolve.

The master plan correctly identifies this subcommittee as the entity responsible for nonstructural communication and coordination. Because its members include the state agencies involved in adaptation activities, this committee is an ideal forum for discussion of policy issues such as community development, land use planning, regulatory standards, and coordination of funding. The committee's work in this regard should include drafting recommendations for action by requisite state and federal agencies. Issues for discussion are presented below.

- State programs and resources should, at a minimum, be consistent with the master plan and the nonstructural measures contained therein. For example, Community Development Block Grant funds distributed by the state should contribute to the goals of the master plan.
- Distribution of funds to parishes should reinforce the recommendations of the master plan.
- The Louisiana Governor's Office of Homeland Security and Emergency Preparedness is revising its hazard mitigation plan. We support the effort to streamline this plan so it can be more easily used. The agency also requires additional funding so that it can move toward enhanced hazard mitigation plans, pursuant to Section 322 of the Stafford Act Amendment 2000.
- Identify funds for implementing the $10.2 billion allotted for nonstructural measures in the master plan, including use of RESTORE Act funds and new revenue streams.
- Enhance and support strong working partnerships with parishes. These partnerships should support coastal parishes as they either create comprehensive land use plans or make existing plans more consistent with the 2012 Coastal Master Plan's emphasis on nonstructural activities.

Recommendation: The CPRA should communicate about non-structural measures by establishing and leveraging partnerships with non-governmental organizations and communities.

As we discovered, informing coastal residents about risk and risk reduction is an ongoing and crucial need, particularly when this information includes identification of resources that can help people take action. The master plan likewise notes the necessity of education and training activities of many types, including clarifying funding opportunities and teaching officials how to leverage them, making individual homeowners aware of changes in flood insurance, and training building contractors on floodproofing and elevation techniques.

CPRA has already established a model for an outreach partnership in its collaboration with the Center for Planning Excellence, which produced the Louisiana Land Use Toolkit. Expanding this model going forward, the CPRA should take the lead on distilling information on adaptation measures into targeted outreach tools, while NGOs, businesses, and local communities would share these tools with their networks throughout south Louisiana. We suggest that the following tools and programs be part of the outreach effort:

- a one page fact sheet/flow chart to guide residents as they recover from a flood or storm;
- a website that serves as a clearinghouse of information about programs and funding available to individuals and local governments;
- an outreach campaign leading into hurricane season that uses a variety of media to explain options for funding and implementing adaptation measures (include fact sheets, online news articles, radio and TV talk shows, web chats, email blasts, and other tools);
- training for professionals key to implementation, including bankers, realtors, planners, and local code enforcement officials;
- an expo for parish employees, residents, vendors, and state agencies to share ideas and progress made on implementing nonstructural measures (include reporting on accomplishments at the parish and state levels).

Recommendation: The CPRA should consolidate and publish data to quantify the costs of unwise development, identify new revenue streams for community resilience, and support sound decision making.

With coastal wetland loss continuing and climate change threatening more extreme weather and higher sea levels, development that ignores risk is not practical option. The state is already working to gather and organize information related to flooding risks from ongoing model-based analyses. In order to compare options, create incentives, and inform decision making, we suggest that information such as the following be shared:

- dollar value of increased risk from current building and land use practices in floodplains;
- information about the variety of best practices that can save floodplain dwelling communities hardship and dollars;
- losses (in dollars) averted by nonstructural measures both locally and nation wide;
- Flood Insurance Risk Maps and other tools to explain flood risks at the community level;
- information that pulls from region's tradition of adaptability and resilience and shows how it can be reinvigorated to meet current challenges.

Getting Started: Case Studies from North Carolina

As Louisiana moves its nonstructural program forward, the experiences of North Carolina can offer useful perspective. Like Louisiana, North Carolina has a large, intensely used coastline. And like Louisiana, North Carolina has faced an onslaught of hurricanes in recent years, which caused billions of dollars in damage. North Carolina's response to its own flooding crisis reflects the usefulness of both data gathering and civic action. Neither approach, on its own, is sufficient to support success. Together, both information and public involvement help communities make sound, long-term decisions. Our first case study also shows that without strong political support, even the best technical efforts can be undermined.

Case Study #1: North Carolina's Floodplain Mapping Information System

(http://www.ncfloodmaps.com/)

Hurricane Floyd caused damages to North Carolina worth $3.5 billion in 1999. This spurred the state to partner with the Federal Emergency Management Agency as a Cooperating Technical State. In this role, North Carolina assumed primary responsibility for upgrading and maintaining its own Flood Insurance Rate Maps (FIRMS). These maps show which properties in a community are likely to flood and the extent of that flooding. By supplying this information, FIRMS provide the basis for assessing

who should buy flood insurance and how high insurance premiums should be. Even more important, FIRMS provide the means for understanding a community's basic level of flood risk.

All North Carolina counties and municipalities have elected to join the National Flood Insurance Program. This program requires that FIRMS be used as the basis of participating communities' floodplain management. In other words, the program requires that FIRMS serve as benchmarks for regulation of development. FIRMS also provide due public notice that such regulation will take place. In both of these ways, FIRMS affect politically charged development decisions.

In producing the upgraded FIRMS, North Carolina has performed one of the most detailed assessments of flood risk in the nation. Its FIRMS are based on LIDAR (a laser based detection system that resembles radar). The maps use a two foot resolution for examining all building footprints with finished floor elevations of greater than 1000 square feet.[1] The results are presented in a geographic information system (GIS). State residents can easily access information about their flood risk, not just as static maps, but also in real time. The state supplements the provision of flood risk information with extensive outreach and training for residents, businesses, and local governments.

This detailed and accessible information has helped communities put measures in place that will reduce the state's vulnerability to storms (see Case Study #2 below). However, in 2012, the North Carolina legislature proposed a bill that would require the state to use estimates of sea level rise that are based only historical data. The bill excluded the findings of a recent climate change study by the North Carolina Coastal Resources Commission, which predicted a meter of sea level rise along North Carolina's coast over the next century. Such findings, according to the legislature's bill, were not to be consulted when the state was setting policy, including policies related to floodplain management.

The bill sparked an uproar and derisive national press about North Carolina's attempt "to make sea level rise illegal." In the end, North Carolina's governor allowed the bill to become law. It imposes a ban until 2016 on defining sea level change for regulatory purposes. In the meantime, a second state-sponsored sea level rise study will have been completed, which will inform further state deliberation on the issue. Because it prevents the use of more accurate sea level rise predictions in near-term policy making, the 2012 bill severely reduces the accuracy with which North Carolina communities can plan their futures, even though their state has been a national innovator in flood risk mapping.

The impetus for the 2012 bill came from development interests that may have been seeking to protect permitting and development options in and around the state's coastal areas. This interest group's influence speaks to the need to supplement technical findings with targeted alliances that can mitigate resistance to change. North Carolina's example shows that a strong technical program, while enormously beneficial, must be supplemented with a big tent approach to public outreach, particularly when powerful interests have a stake in maintaining the status quo. The case study below shows that a data driven, collaborative process, can achieve this level of buy-in.

Case Study #2: Breaking the "Hydro-Illogic" Cycle[2]

(http://charmeck.org/stormwater/StormWaterAgencies/Pages/FloodplainMapping.aspx)

Officials in and around Charlotte North Carolina wanted to avoid what they termed the "hydro-illogic" cycle, in which major floods spur plans for expensive risk reduction projects that are out of touch with local budgets and needs. Because of this disconnect, the proposed plans are never implemented, leaving the community vulnerable to the next flood.

To break this cycle, a coalition of developers, environmentalists, city officials, engineers and others began an intensive collaboration in the early 2000s to identify problems and consider options. The diversity of this coalition was essential, as was the group's commitment to working together through charged discussions about the future of their community. By persevering in these discussions, enough trust was gained to encourage each interest group to identify their priorities. Charlotte's population had grown a great deal during that time, and developers were integral to the group's discussions. As ideas

[1]Personal communication, Gavin Smith, 4/2013.

[2]This case study uses details from a discussion of Charlotte, N.C. in "Planning for Disaster Recovery: A Review of the United States Disaster Assistance Framework," by Gavin Smith. Public Entity Risk Institute: Fairfax, VA. 2011, pp. 269-270.

were shared, developers made clear that they were not only interested in gaining new construction permits. The liability associated with flood prone properties meant that they too had a vested interest in learning more about flooding risks.

The group's discussions were guided by a goal of joint fact finding, or identifying information about flooding risks that everyone at the table could agree was valid. In this respect, the state's new FIRMs (see Case Study #1 above) were essential. Charlotte's local government provided two floodplain maps: one tied to existing conditions and one reflecting future conditions. Once the group agreed that the accuracy of the FIRMs could be trusted, several opportunities for finding common ground emerged.

Staff from the city/county government provided the group with detailed scenarios that showed how flood elevations changed depending on the kind of development scheme implemented. This allowed the group to put a dollar figure on the flood losses to be expected under different conditions and assumptions. In this way, the financial impacts of future action were clearly demonstrated to all participants. Choosing to look at the challenge through a financial lens proved fruitful. Eventually, all of the group's members, including the developers, saw the benefit of strong floodplain development standards that exceeded the requirements of the National Flood Insurance Program.

Since this agreement was reached, progress in Charlotte and Mecklenburg County has been substantial. Construction of levees is restricted. The program has bought over 200 structures located in the floodplain and converted the area into open space, including greenways and wetlands. As a measure of the rigor of the community's regulatory program, county staff flags all properties adjoining the floodplain. This stops all permits until a floodplain development permit has been received and places an automatic hold on each certificate of occupancy to verify that the conditions of the permit are met.[3] All new construction, including substantial improvement projects, must abide by the minimum flood protection elevation (the community floodplain/future conditions elevation plus 1 or 2 feet of extra height to allow for high water) determined for that area.[4] Upgrades to FIRMs continue, in order to keep pace with changes in development patterns throughout the Charlotte area.

[3]State of North Carolina. "Safer Development in Floodprone Areas: Second Edition, 2011." p. 120.

[4]Ibid, p. 120.

The progress made in Charlotte stems from three factors: (1) that community's determination to proactively address their flooding challenges; (2) the state's embrace of innovative, science based flood mapping techniques; and (3) the use of a collaborative process that enabled diverse interests to identify mutually satisfactory measurements of future flooding harm as well as solutions for the city's future.

Conclusion

As the results of the National Wildlife Federation's study and the experience of North Carolina makes clear, improving community safety requires a multi-pronged approach. We applaud the CPRA's commitment to providing increasingly accurate estimates of flooding risks. This information will help Louisiana communities better understand how to plan for the future.

To be effective, the process for sharing this information is critical. Our study results and the experience of other states show that nonstructural plans require an intensive level of customization. In most cases, local leaders and residents—not the state—will be responsible for implementing these plans. Therefore, the plans must address local needs and draw on local resources and coalitions. Doing so is a matter of practicality. Plans that are not tailored to communities will not only be irrelevant, they will be ignored.

With this in mind, we caution the state against drafting nonstructural plans without including communities as full partners. Instead, the flood risk data gathering process should spur joint discussions between the state and communities. Our first recommendation (page 3) offers one way to handle these discussions. This approach will allow a full exchange of interests to be conducted, as was done in Charlotte to good effect. We appreciate the time and energy required. However, skipping this step and coming to communities with a draft already in hand will not encourage a useful level of disclosure or problem solving.

We look forward to supporting the state is it implements its nonstructural program and offer our help in service to this important goal.

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Appendices

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Guide to Appendices

Appendix A: Introduction to Nonstructural Measures

A-1: Methods for Creating Resilient Communities. Explains what nonstructural measures are and their optimal use.

A-2: Obstacles to Action and Options for Making Progress. Explains the challenges involved in adopting nonstructural measures in coastal Louisiana.

A-3: Selected Best Practices: Nonstructural Measures. Presents case studies from around the U.S. that reflect successful implementation of nonstructural measures.

Appendix B: Developments Related to Nonstructural Mitigation in Coastal Louisiana

B-1: The History and Status of Nonstructural Mitigation in Louisiana. Describes the history of flooding in coastal Louisiana and how this has affected local planning efforts. Also presents condensed results of the National Wildlife Federation's study of coastal parish attitudes toward nonstructural measures. See Appendix G for more in-depth discussion of study results.

B-2: National Development of Nonstructural Mitigation (Timeline). Presents a graphic history from 1927 through 2011 capturing key milestones in the nation's move to adopt nonstructural measures.

Appendix C: Legal Issues Associated with Nonstructural Mitigation

Provides case law for local government officials to consider. Emphasizes strong legal precedents for sound land use ordinances that can protect residents and businesses from flooding.

Appendix D: National Sources of Funding and Technical Assistance

Provides list of federal agencies offering funding and programs to local governments that want to adopt nonstructural measures. Also includes resources provided by selected national organizations and private foundations.

Appendix E: Resources for Louisiana Communities

Lists Louisiana-based organizations and agencies offering support and tools, primarily to communities and citizens.

Appendix F: Alliances and Sponsors of Nonstructural Activities in Coastal Louisiana

Presents two matrices that show approximately 500 different organizations and the extent to which they are coordinating efforts to support adoption of nonstructural measures.

Appendix G: Research Conducted for This Study

Describes the methods that the National Wildlife Federation used to assess attitudes and adoption of nonstructural measures in coastal Louisiana parishes. Provides the results of this study, including interview findings and major themes.

Appendix H: National Wildlife Federation Study Results

H-1: Data Collected from Parish Websites and Newspapers. Louisiana coastal parish newspapers and local government websites were surveyed for topics related to nonstructural measures. Provides 70 pages of individual parish survey results.

H-2: Community Participation in Nonstructural Programs. Reviews parish participation in the National Flood Insurance Program and the Community Rating System.

Appendix I: Bibliography & Other References

Bibliography and Other References. Provides 80 pages of sources and research summaries on issues related to nonstructural measures, including reducing flooding hazards, planning, and risk communication.

Check Out:

Chart on p. 6 of Appendix A-1 that provides pros and cons of structural and nonstructural measures.

Fact sheets on p. 2 of Appendix A-3 that summarize national success stories.

Explanation on p. 3 of Appendix B-1 that explains Louisiana's wetland loss crisis and how this, in combination with climate change, has spurred the need for innovative land uses.

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Appendix A

Introduction to Nonstructural Measures

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Appendix A-1

Methods for Creating Resilient Communities

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Climate change is predicted to bring stronger hurricanes, rising seas, changing weather patterns, and other effects. These trends will put increasing pressure on south Louisiana, a region already facing crisis level wetland loss and subsidence rates. Levees and other structural measures that reduce flooding hazards offer one set of tools for meeting these challenges. Another set of tools, often called "nonstructural measures," is equally important. This appendix explains several nonstructural methods including flood prevention, property protection, natural resource protection, emergency services, and public information.

Preventative Measures

Building Codes: Building codes require construction to a standard most suited to the natural environment where the structures are located. Louisiana has adopted the 2009 International Building Code, and the state has passed legislation that enables rapid adoption of newer codes. Communities must use the statewide code, but state law allows communities to strengthen their hazard resilience by defining the threat to be higher than the code's minimum standard. These regulations have given Louisiana one of the nation's most stringent building codes, but implementation challenges remain. One of the primary challenges involves the need for regular code inspections. Louisiana has yet to build adequate capacity in this area, and without it, the state's strong building code regulations will not be put fully into practice.

Freeboard and No Adverse Impact Requirements: All communities that participate in the National Flood Insurance Program are required to adopt certain floodplain regulations. These regulations help ensure that the risks of construction in floodplains are reduced. However, the regulations must be continually upgraded given that flood elevations can continue to increase over time. To achieve these upgrades, communities may choose to enact more stringent floodplain requirements.

These requirements include freeboard, which involves elevating a building's lowest floor above predicted flood elevations by a small additional height (generally one to three feet above National Flood Insurance Program minimum height requirements). Freeboard doesn't substantially change the look of the structure, but it reduces the likelihood of flooding. As stated above, Louisiana has adopted a uniform statewide building code for commercial and residential buildings, based on the International Building Codes series, and floodplain regulations that apply to buildings are embedded in the code. Communities cannot modify the code, but they can raise protection levels by defining the threat (flood level or wind speed) that must be resisted. By choosing to use a higher flood level than what is stipulated in the statewide building code, communities can incorporate a freeboard requirement.

The No Adverse Impact standard is another regulation that should be considered, but it must be adopted not by individual locales, but at the state level. This standard stipulates that no one property owner can act in such a way that increases flood risks for others, unless those impacts are explicitly mitigated as part of a community or watershed plan.

Planning and Zoning: Planning and zoning ordinances can direct development away from problem areas, especially floodplains and wetlands. This involves allowing or requiring land uses that are compatible with the natural conditions, including flood risks, experienced by that area. Use of the land can be tailored to match the land's hazards, typically by designating flood prone areas as parks, greenways, golf courses, backyards, wildlife refuges, natural areas, and so on. Land use ordinances can also allow developers more flexibility in arranging improvements on a parcel of land through the planned development approach. Whenever possible, the best option is one that avoids development in hazardous areas in the first place, although this can be difficult to achieve.

Stormwater Management: Stormwater management is an excellent tool for minimizing drainage related flooding as well as water quality concerns from surface runoff. The phrase "stormwater management" is defined in different ways. It can be narrowly defined to mean minor surface water issues. It can also be defined to mean management of the water quality of surface runoff. This paper defines stormwater management more broadly to include all issues relating to water that falls from the sky (that is, stormwater) and the many riverine issues that result, including floodplain management, watershed management, water quality, and flood risk reduction.

In an undeveloped watershed, stormwater is stored upstream, in ponds, basins, and permeable surfaces close to the runoff area of origin. The water is released slowly at rates that can be accommodated within downstream streams and channels. This can also be done in an urban area where ditches, parking lots, and low lying vacant areas act as water holding locations that release runoff more slowly. Retention and detention strategies have been used in Louisiana for many years, with the canals in Jefferson and Orleans Parishes serving as examples of de facto retention basins. Interest in expanding this approach has been growing through recent dialogues between Louisiana and Dutch stormwater management officials.

The principles of stormwater management suggest that alterations to drainage systems be considered using watershed-wide master drainage plans that identify problems and potential solutions, determine effects of any changes, and recommend the best courses of future action. In other words, the system must be managed as a whole. A project by project approach to stormwater management will not produce good results. In the same vein, local governments must go beyond the minimum FEMA floodplain management standards. By themselves, the FEMA standards allow for increasing flood risk:

- FEMA's regulations recognize the important conveyance function of the floodplain (floodway) under existing conditions, but the regulations do not value the equally important and critical storage and natural/beneficial use function of floodplains. To offset development impacts, compensatory storage must be provided.
- FEMA regulations do not acknowledge the need to offset watershed urbanization. Such urbanization increases the number of impervious surfaces that do not allow water retention. Unless compensated for, this trend will result in higher and more rapid flood waters.
- FEMA regulations are based on a "regulatory flood" standard, generally 1/100 year, and do not recognize that a major share of annual flood damages occurs outside the boundaries of the minimum regulatory flood zone. Regulations and physical projects should be based on calculations of floods that can occur when the watershed is fully developed. This is very difficult to encourage through federal regulations.

Property Protection Measures

Building Elevation: This option involves raising a structure's lowest floor so that floodwaters flow beneath. Home elevation is being used with increasing frequency in coastal Louisiana, and it is an effective means of reducing flooding risk to many existing structures. There are some downsides, however. The higher the house is raised, the more vulnerable the roof and walls become to storm and hurricane winds. The process of elevating the home can also harm the structure's foundation. Furthermore, some coastal Louisiana residents fear that elevating their home will make it resemble a "camp" and will therefore reduce their property's value. While this perception is common today, many parts of coastal Louisiana had a history of elevated home construction prior to the current emphasis on slab-on-grade construction. Recent floods have shown the value of this tried and true construction method.

Some residents and businesses also express concern about the accessibility of elevated structures. However, there are ways to design elevated structures so that accessibility is maintained. This can include the use of lifts, elevators, ramps, and stairs that are easy to navigate. Elevation can be costly and time-consuming, but it is a commonly used strategy that can be less disruptive to a community than acquisition.

Acquisition: Acquisition involves buying flood prone properties, demolishing or relocating the structures on site, and, in FEMA mitigation programs, restricting future use of the property to open-space activities. This mitigation measure is often considered the most effective way to reduce flooding risk, because it completely removes structures from harm's way. However, acquisition can be quite challenging in coastal areas. First, there is a shortage of land outside the flood hazard area on which property owners can rebuild while staying within the same community. The ability to rebuild in reasonable proximity to the original community is an important factor since many people's livelihoods require that they live in coastal areas. Residents also have concerns about leaving places where their families have lived for generations. Finally, local governments fear that acquisitions will lead to erosion of their community's tax and infrastructure base.

For all of these reasons, acquisition is very unpopular in Louisiana, with a recent survey showing that respondents in the coastal zone consider it absolutely the least relevant strategy.[1] It is a significant challenge to have the most effective nonstructural measure—moving people out of harm's way—also be the least popular option overall. Discussions of this measure can be more constructive when residents have time to fully develop and understand their options. Unveiling this option when residents are under pressure from a recent flood event is not likely to create good outcomes.

Reconstruction: This option is used when a house has incurred so much flood damage that it would be cheaper to tear it down than to repair it. Under this approach, the house is demolished and replaced with a stronger, disaster resistant home of a similar size and style (FEMA 1998). FEMA funding for reconstruction has only been available to certain communities, initially through a pilot project in Louisiana and more recently through inclusion in the Pre Disaster Mitigation Grant Program. What are the prospects for increased funding? Is this a measure that should be expanded? Need more information here.

Floodproofing: Floodproofing refers to the use of two strategies: either keeping water out of structures through a system of barriers, or designing the structures to occasionally accommodate floodwater by making the reconstruction process easier. Floodproofing measures can be incorporated into both new and existing construction but are only useful under certain conditions.

Dry floodproofing is a mitigation measure that stops floodwater at the exterior walls of the building using sealant materials (impermeable coatings or membranes) and special closures over or under doors and windows. This type of retrofitting works in limited applications, such as well built homes and businesses that experience shallow flooding. In addition, dry floodproofing can be used to make a non-residential building compliant with flood damage prevention ordinances and is therefore eligible for federal mitigation funding programs. Dry floodproofing does not make a residential building compliant with flood damage prevention ordinances, and use of federal mitigation funds for residential dry floodproofing has been limited to a few demonstration projects. Dry floodproofing is not advisable if flood waters are likely to reach higher than three feet, or if the structural integrity of the building is in question.

Wet floodproofing is an alternative method that is less common but relatively inexpensive. Instead of creating barriers to keep water out, wet floodproofing allows uninhabited areas to accommodate flood waters with minimal damage. For example, household appliances, such as water heaters, A/C units, or washers/dryers may be raised off the floor so they can remain dry during a flood. Other examples include venting crawl spaces or basements so that water enters and exits freely; using flood-damage resistant building materials such as brick or ceramic tile; and installing removable drywall, floor drains, and weep holes. These measures can be used effectively in conjunction with elevation and are required in areas below the flood protection level when a building is elevated.

Dry floodproofing and wet floodproofing can be used together to keep water from entering some parts of buildings while allowing it into others. For example, floodproofing a garage door is difficult, so homeowners may choose to let the garage flood (using wet floodproofing techniques) and dry floodproof the walls between the garage and the rest of the house.

Minor Flood Control: Floodwalls and berms are free-standing barriers that surround individual or small groups of buildings on individual or neighboring properties. Homeowners in eastern St. Tammany Parish personally financed such barriers to protect suburban neighborhoods from the spring floods of the Pearl River (Laska, 1991).[2] Like floodproofing, floodwalls and berms have limited applications and are effective only under certain conditions. Berms are small, non-engineered levees. Usually not exceeding four feet in height, these barriers serve the same purpose as sandbags but may be more permanent. Construction requires enough space between houses to accommodate the berm or floodwall. In addition, if the property is accessed through a gap or low spot in the protective barrier, the entry gap must be filled before a flood (FEMA 1998).

[1]Norris-Raynbird, Carla (2011). *Local CZM Capacity Pre and Post Hurricanes Katrina, Rita, Gustav and Ike: A Comparison Study.*

[2]Floodproof Retrofitting: Homeowner Self-Protective Behavior, Shirley Bradway Laska, Institute of Behavioral Science, University of Colorado, 1991, pp. 199-220. CURS Report No. 91-04.

Floodwalls and berms are supposed to keep water out of targeted areas, but their use must be carefully monitored to ensure that overall floodplain storage capacity is not overly reduced. Otherwise, these barriers could raise flood levels outside the protected area and cause damage on adjacent properties. In addition, barriers positioned around a large area can trap a great deal of rainwater that must be removed. Both of these problems can be minimized by placing the barrier close to the building needing protection, rather than on the perimeter of the property.

Insurance: The National Flood Insurance Program makes flood insurance policies available to homeowners whose homes and businesses are located in participating communities. The purchase of flood insurance is a wise decision both within and outside the regulatory floodplain. These policies do not protect actual structures from water, but they provide funds to repair and restore affected buildings following a flood. Flood insurance can be particularly valuable to owners whose properties are subject to shallow, frequent flooding but are not likely to receive a disaster declaration. Coverage can be purchased for the structure itself as well contents. Policies are also available for renters who want to protect their contents, regardless of whether the building owner has coverage for the actual structure. A further benefit of an NFIP policy is the availability of an additional claim payment that can help cover the costs of mitigating and protecting substantially damaged buildings from future damage.

Natural Resource Protection Measures

Environmental Restoration: Because Louisiana's land loss crisis is so severe, projects and activities that seek to restore the wetlands and coastline are critical. Restoration projects help to maintain the coastal land masses and surrounding wetlands that provide extensive economic and social benefits to the state and nation (see Appendix B-1). These projects also help restore barrier islands and wetlands that protect Louisiana coastal communities from storm surge.

There is much debate about which projects are best for the coastal Louisiana's delicate ecosystems. Structural flood control systems can benefit one area but have negative impacts on another. For example, a levee may become a salinity barrier that selects against a certain fish species. Louisiana's 2012 Coastal Master Plan includes over 100 projects, including restoration projects, structural protection projects, and nonstructural projects. The implementation of all projects must be monitored carefully to optimize performance and apply lessons learned.

Emergency Services Measures

Critical Facilities Protection: Critical facilities refer to structures key to the day to day operation of a community: hospitals, fire and police stations, utilities, government buildings, and schools. In some cases, communities elect to construct critical facilities to a higher standard than other residential and business structures. This recognizes the value of those facilities in an emergency and the need to have them remain operational. Examples include constructing or retrofitting critical facilities to withstand higher wind ratings or elevating them above the flood of record when it exceeds the required elevation. The International Building Codes, which are in effect in Louisiana, require higher levels of protection for construction of critical facilities.

Evacuation: Evacuation is the only guaranteed way to keep people safe from rising flood waters; all other flood risk reduction measures serve only to protect property. Typically, officials mandate evacuations when a hurricane Category 3 or higher is expected to make landfall. To ease traffic flow during these instances, the in-bound lanes of four-lane highways and interstates are reversed, allowing twice as much traffic to evacuate outbound (typically referred to as contra flow). The state's contra flow plan is explained in the Louisiana Citizen Awareness & Disaster Evacuation Guide.

Some concerns about evacuation include associated costs and people's varying abilities to leave. When evacuating, people must be prepared to be away from home for at least two to three days. Money is needed for gas, hotels, and meals. Hotels may fill quickly and prices may rise as demand increases. People may not want to leave pets at home if they are unable to evacuate with them. Furthermore, not everyone owns a car or is able to carpool. In metropolitan areas, buses or other transportation may bring people in need to designated shelters. But shelters vary in quality, and residents using this service have no say as to where they are taken. For all of these reasons, evacuation is a disruptive process that poses challenges for all groups, especially the poor and infirm.

Public Information Measures

Education and outreach of the public and other stakeholders can be an effective and inexpensive means of reducing flood risk. An increased awareness of risk and of the possible steps that can be taken to mitigate those risks, can spur constructive action for individuals and communities. To be successful however, public information must be both broadly shared and tailored to different audiences. These requirements make public information a time intensive measure that should be pursued not only in the aftermath of disasters but as part of an ongoing outreach program.

RESTORE THE MISSISSIPPI RIVER DELTA

NATIONAL WILDLIFE FEDERATION

Advantages and Disadvantages of Adaptation Measures

Adaptation measures should compose an overall system that uses both nonstructural and structural mitigation. Evacuation planning, zoning, warning systems, and minor protective measures are necessary counterparts to large built structures such as levees, which may fail.

The following table provides a comparison of flood protection approaches produced by the U.S. Army Corps of Engineers. The table does not include all types of nonstructural measures, nor does it mention all of the limitations of structural measures, but it serves as a good starting point for comparison.

COMPARISON OF FLOOD PROTECTION APPROACHES[3]

Structural Flood Control	Acquisition/Relocation	Flood Proofing
Protects development without disrupting existing buildings or patterns of development	Disruptive: successful only if owners willing to sell and leave	Protects development with minimal disruption to existing buildings and development
Can disrupt natural water flows and/or destroy wildlife habitat	Does not disrupt natural water flows or damage wildlife habitat; can improve habitat	Does not disrupt natural water flows or damage wildlife habitat, but may affect local drainage
Can protect to any flood level. Note that there are design limitations, as well as cost factors to consider.	Generally most cost-effective for deep flooding and/or high velocity flooding	Some measures are only appropriate for low flood hazards
Can be the most cost-effective and practical solution for areas already densely developed. Note that this does not take into account the costs of impacts to the environment.	Can be the most cost-effective solution in areas of damaged or low-cost buildings	Can be the most cost-effective solution in areas with low flood depths
Large capital expenditures often make this approach cost prohibitive or dependent on state or Federal assistance	Cost depends on property values, often done with state or Federal assistance	Many approaches can be afforded by the property owner
Protects streets and land in addition to buildings. Note that a failure leads to an impact of the entire protected area.	Can remove all types of property that need protection from floods	Focuses on protecting buildings
Publicly owned, operated, and maintained, so more dependable over the long run	No operation and maintenance needed to keep flood protection benefits	Operation and maintenance dependent on every current and future occupant
Built to a certain flood protection level that can be exceeded by larger floods, causing extensive damage	Only properties outside the cleared area are subject to damage from larger floods	Built to a certain flood protection level that can be exceeded by larger floods, causing extensive damage
Can create a false sense of security as people protected by a project often believe that no flood can ever reach them	Damage level does not increase if flood levels increase	Can create false sense of security, especially if mainte¬n¬ance neglected or new owners not familiar with operation. Note that this also applies to floods greater than the design level.
May improve property values and encourage more development	Communities lose some tax base and utility customers (may be offset by using vacated land for parks or other assets)	Preserves tax base and may improve property values
Water supply and recreational uses can be incorporated into some projects' designs	Cleared out area can be converted to recreational, educational or ecosystem restoration uses	Preserves existing buildings and land uses. Compatible with existing ecosystem
Although it may be unintended, can promote more intensive development in the flood plain	May encourage more intensive development in adjacent areas as people want to be near parks that were created on vacated land	Should encourage property maintenance and preservation of existing development
Can have adverse flood plain and ecosystem impacts, e.g., higher flood stages and degraded ecosystem	May have positive flood plain and ecosystem impacts	Usually no change to flood plain or ecosystem

[3]USACE 2005 *Local Flood Proofing Programs.*

Existing Resources

There are many sources of funding and technical assistance for carrying out nonstructural measures in coastal Louisiana. However, no one program, on its own, is sufficient to meet the needs of a community. Instead, communities must take bits and pieces from various programs and agencies and tailor a program to meet their needs. The analogy of a patchwork quilt is useful for clarifying the process for communities seeking viable, common sense solutions to reducing risk. Much as a quilt is made from scraps of cloth, a comprehensive approach requires the combination of many elements to create a useful whole.

The efficient way to fashion a quilt is to create a design, map out a plan, and measure each piece. Just as quilters look to patterns for guidance, community leaders can turn to a number of resources such as successful plans, building codes, and other materials already developed in other communities. These resources can provide the technical guidance and ideas needed to develop sustainable nonstructural projects.

Appendix D provides information on many sources of funding and technical assistance. These sources include:

- Various federal agencies such as: FEMA, HUD, EPA, EDA, SBA, USDA, NOAA and USACE.
- Professional associations and organizations such as: ASCE, APA, ASFPM, and NHMA.
- Sources of grants for research and projects such: NSF, OxFam and other foundations.
- Existing standards such as: No Adverse Impact and Fortified for Safer Living.

The availability of so many different nonstructural measures can make it challenging to develop a coherent program. Nevertheless, the sustainability of our coastal communities depends, in large part, on our ability to use these resources to good effect.

Appendix A-2

Obstacles to Action and Options for Making Progress

Lead Author: Alessandra Jerolleman

RESTORE THE MISSISSIPPI RIVER DELTA

NATIONAL WILDLIFE FEDERATION

Climate change is predicted to bring stronger hurricanes, rising seas, changing weather patterns, and other effects. These trends will put increasing pressure on south Louisiana, a region already facing crisis level wetland loss and subsidence rates. Levees and other structural measures that reduce flooding hazards offer one set of tools for meeting these challenges. Another set of tools, often called "nonstructural measures," can be equally important. This appendix explores why nonstructural measures are not always adopted in south Louisiana. The appendix also presents strategies for informing targeted audiences about the benefits of these measures.

The Local Perspective

Overview: Climate change adaptation is taking place in coastal Louisiana. Since the storms of 2005, coastal residents have grown more interested in preparing for high water in their communities. However, locals still tend to view levees as a primary defense against flooding, and only a few nonstructural measures (elevation, evacuation, and public information) are consistently practiced. Other measures, including land use regulations and building codes, face a great deal of resistance.

The measures most practiced at this time are those receiving an influx of federal funding. This is particularly true for residential elevation. The strong preference for structural mitigation, as well as acceptance of only those nonstructural measures that are promoted and funded with federal dollars, pose serious challenges to the widespread adoption of a varied strategy.

Floodplains offer natural and beneficial resources that should be considered in planning as multi-use areas, such as community parks, recreation and open-space. This concept is crucial for coastal Louisiana where waterways frequently rise to the top of channels and then overtop. However, a very high percentage of land in coastal Louisiana parishes sits within floodplains. The lack of available land, as well as the recent preference for slab on grade construction, both pose challenges to good land use planning. The region's formerly long-held tradition was to build elevated homes on natural ridges. Reviving a variant of this tradition, where appropriate, may be a way forward as the region seeks to secure its future.

The Louisiana Coastal Protection and Restoration Authority has begun to organize a Coastal Community Resiliency Program. This program will include coordination by a CPRA subcommittee and input from an advisory group. The state's contributions, particularly in coordinating agency action and serving as a clearinghouse of information, will be critical in moving nonstructural measures forward.

In addition to the state, local groups have a stake in finding ways to adapt to flooding hazards. These groups include residents; elected officials; local officials, including employees with regulatory functions; and developers. In order to successfully foster conditions for wise decision making around hazards, it is necessary for at least one of these groups to see the value of nonstructural measures. A network of advocates is working on these issues as well, but their efforts need to achieve a broader level of acceptance.

Residents: Local residents may be moved to action by a more accurate understanding of the risks they face, as well as education regarding the measures they can take or advocate for in their communities. Experiencing dramatic or frequent flooding also contributes to a more favorable consideration of nonstructural measures, particularly when levees fail or are seen as too expensive or harmful to the ecosystem.

Elected officials: Politicians function within brief electoral cycles, and are hard pressed to take potentially unpopular actions whose benefits may not be immediately obvious. It is therefore not surprising that local politicians tend to place the blame for storm damage on the federal government and the U.S. Army Corps of Engineers. Along with this strategy comes support for structural mitigation, with little backing for regulatory strategies.[1] The desire to externalize the blame can make it more difficult for communities to engage in frank discussions of their risks and the potential solutions, some of which can require difficult choices. This trend is compounded by federal policies, such as those pertaining to disaster relief, which can contribute to the externalization of blame, risk, and cost. However, politicians do react to the pressures of their constituents. In this context, education can be a powerful tool that needs broader application.

Local officials: Code officials and floodplain managers have important roles to play in the adoption of nonstructural mitigation. In some cases, these employees are well informed and agents for productive change. Other employees need training and resources to learn more about national best practices and how to tailor them to their communities. With this information, they can bring a new level of rigor to their jobs and provide more nuanced options to local elected decision makers. Having accurate information about the costs of unwise development can be a powerful tool for local officials interested in reducing future losses.

In general local officials have become more knowledgeable about attracting recovery dollars. However, these officials respond to increased state and federal regulations in very different ways. In a recent study, Norris-Raynbird (2011)[2] found that local officials engage in one of three strategies in response to regulations: stall tactics, such as fighting the regulations or disputing the data; enforcer strategies which strictly enforce regulations; and soft compliance, which stresses education and over conflict. The first two of these compliance strategies create significant challenges for the implementation of nonstructural mitigation measures.

[1]Norris-Raynbird, Carla (2011). *Local CZM Capacity Pre and Post Hurricanes Katrina, Rita, Gustav and Ike: A Comparison Study.*

[2]Norris-Raynbird, Carla (2011). *Local CZM Capacity Pre and Post Hurricanes Katrina, Rita, Gustav and Ike: A Comparison Study.*

Developers: Local developers can be shown the value of mitigation as a means for safe development and a positive professional reputation. The benefits of nonstructural mitigation can also be marketed as creating long term cost savings for the end user, resulting in increased sales.

Advocates: A diverse group of engaged public, private, and nonprofit stakeholders and individuals are investing time and resources on environmental issues, disaster preparedness and recovery, community development, and resiliency (see Appendices E and F). These entities and individuals represent local, state, regional, and national interests. Our researchers found several cases in which organizations are involved in similar projects, without being aware of each other. There are a great many alliances and collaborations, but none that fully capture the wide range of ongoing efforts. This diverse group can help promote hazard mitigation. However, unless this work is better coordinated, it could spur duplication, missed opportunities, and competition for resources.

Nationally, new initiatives related to climate change adaptation are emerging. Not only must the interest of newly engaged national stakeholders be encouraged, but those efforts should be integrated into local initiatives within coastal Louisiana. Local advocates are not necessarily aware of national opportunities for technical assistance and funding. Finding ways for national and local groups to work together can spur continued progress.

National Perspective

As previously described, there are significant constraints to the adoption of nonstructural measures in coastal Louisiana. However, several of the challenges present in coastal Louisiana are also present in flood-prone communities across the nation. Land loss is a challenge which many coastal communities face, and much of our nation continues to rely on levees for flood protection. In fact, development that does not take true risk into account continues behind levees and within floodplains nationwide. This type of development can raise flood heights as much as three to five feet.[3]

Billions of taxpayer dollars are used to respond to flood damage throughout the U.S. As with all flood prone communities, these payments externalize the costs and impede adoption of measures that would reduce flooding damages. U.S. taxpayers thus need a better understanding of the costs involved in unwise development and over-reliance on structural measures. Many reports and publications deal with the challenges of floodplains nationwide, as well as the issues raised by current development practices and adherence to the minimum National Flood Insurance Program standard. A listing of reports and resources can be found in Appendices D, E, and I.

[3]Larson/Plasencia paper on No Adverse Impact, www.foods.org

On the other hand, various communities have faced these problems and been successful (see Appendix A-3). One example is Seattle, Washington where since 1998 volunteers have taught homeowners how to retrofit their homes to withstand earthquakes. Thousands of people have taken free classes in libraries throughout the region, and hundreds of buildings have been retrofitted with both structural and nonstructural improvements. Communities like these tailor their activities to meet unique, local needs.

Appendix A-3

Selected Best Practices: Nonstructural Measures

RESTORE THE MISSISSIPPI RIVER DELTA
NATIONAL WILDLIFE FEDERATION

Climate change is predicted to bring stronger hurricanes, rising seas, changing weather patterns, and other effects. These trends will put increasing pressure on south Louisiana, a region already facing crisis level wetland loss and subsidence rates. Levees and other structural measures that reduce flooding hazards are one set of tools for addressing these challenges. Another set of tools, often called "nonstructural measures," can be equally important. These include programmatic measures, such as land use planning, and physical measures such as elevating homes.

This appendix offers examples of communities throughout the U.S. that have used nonstructural measures effectively. Most of these case studies depend on government sponsors working closely with citizens to meet the unique needs of their communities. The resulting success stories offer models for Louisiana communities as they seek to create a secure and vibrant future.

SUMMARY COMPARISON – NONSTRUCTURAL HAZARD MITIGATION BEST PRACTICES IN FACT SHEETS FOR NATIONAL WILDLIFE FEDERATION (SUMMER 2011)

COMMUNITY	STATE	CHARACTERISTICS	FEATURED PROJECTS	PARTNERS	FUNDING SOURCES	INNOVATIONS	SOURCES / CONTACT INFORMATION
Charleston	SC	Atlantic Coast, large coastal city; flood & hurricane risk	"Build a Dune" program: volunteers erect beach fencing that creates dunes	Charleston Project Impact, SC Dept. Health & Environmental Control	Small grants and local fundraisers such as cookbook sales	Creative use of volunteers to reduce disaster losses and improve environment	Carl Simmons, Charleston Project Impact, www.charlestoncounty.org/departments/buildinginspections/projectimpact.htm
Galveston	TX	Gulf of Mexico, barrier island, small city & county; flood & hurricane risk	Elevation, acquisition, strong codes. Bolivar Blueprint recovery plan	Galveston County, FEMA, Texas SHMO, local business owners & citizens	FEMA funds for acquisition, planning, & related projects	Recovery plan: hundreds of beachfront properties cleared in voluntary acquisition project	Frank Billingsley, Houston's KPRC-TV. www.FEMA.gov, www.gcoem.org, conniej.dill@dhs.gov. John Simsen, emergency mgr, Galveston County.
Louisiana House	LA	Baton Rouge, coastal Louisiana; flood & hurricane risk	Demonstration house showcases how to build safer, stronger, smarter	Public-private partnership, university based	Construction & education funded by grants, cash gifts & donated materials	Home & exhibits show scores of safe & sustainable building techniques	Pat Skinner, pskinner@LSUagcenter.org; "Safer, Stronger, Smarter Louisiana House," www.LSUagcenter.com/lahouse
Seattle	WA	Northern Pacific coast, large coastal city; earthquake & flood risk	Earthquake retrofit program: volunteers teach home owners & builders how to retrofit to withstand earthquakes	Neighborhoods, emergency managers, building officials, contractors, & others	FEMA Project Impact grant as 1998 seed money; now carried on by volunteers	Self-perpetuating multi-disciplinary team of volunteers provide free training for building retrofits.	Roger Faris, volunteer. www.Seattle.gov/emergency/prepare/personal/home.htm
StormSmart Coasts	MA	Resources for coastal management. Now active in seven states and growing.	Website of information and networking among communities.	State, communities, experts, and a constellation of federal and state agencies.	EPA, NOAA, the Gulf of Mexico Alliance, and others.	Communications tools to create peer-to-peer network. Melds environmental management with hazard mitigation.	Wes Shaw, lead developer, StormSmartCoasts.org
Hillsborough County (Tampa)	FL	Florida western coast, urban coastal county; flood & hurricane risk	Resiliency projects include surge markers, stronger codes, recovery planning.	Hillsborough County, Florida Dept. of Community Affairs, FEMA	Recovery planning grants from FL Dept. Community Affairs, FEMA	Recovery plan identifies priority redevelopment areas for growth incentives after a disaster	Gene Henry, hazard mitigation manager, http://www.hillsboroughcounty.org/pgm/hazardmit/

Charleston Volunteers Create Beachfront Sand Dunes for Hurricane Protection

Volunteers in South Carolina are building fences for defense against hurricanes. These beachfront fences create protective dunes by capturing sand swirled by wind and water. Sand dunes are nature's first line of defense along coasts. They moderate waves and flooding and provide life-sustaining habitat for wildlife. But dunes are fragile and need protection from wind and wave action. Dunes can also be damaged when people use them as short cuts to the beach.

Volunteers install fencing to capture sand and create protective dunes on Folly Beach, SC (Charleston Project Impact).

Carl Simmons

"Our volunteers love these quick and fun projects. Whole families get involved and enjoy a great morning at the beach." Carl Simmons, executive director of Charleston Project Impact, helps citizens help the beach. He says, "Our volunteers get deep satisfaction from helping protect sea turtle habitats, improve public safety, and preserve our environment." Charleston area volunteers are working in the Charleston Project Impact program, which reduces disaster losses through volunteer and partnership activities. The Build-A-Dune work has a modest cost, and is sponsored through small grants and grassroots fundraisers such as cookbook sales.

Build, Plant, Protect. Build-A-Dune volunteers obtain necessary permits, notify nearby owners, and install sand fencing in V-shaped sections parallel to the ocean. The V shape protects turtle nests. After enough sand accumulates, usually in six to 12 months, volunteers plant vegetation, such as sea oats, to help stabilize the dunes. The dunes need to be aligned with neighboring dunes but not interfere with public access. Dunes must also be protected, so volunteers post signs to discourage people from walking on them.

Quick and Lasting Benefits. Within a year, sand buildup hides the sand fencing. "The first one we did six years ago added 85 feet of dunes that have been hit by three storms and two close calls," Simmons said. "We still have 62 feet of dunes created by these volunteers. They are helping make Charleston a disaster-resistant, sustainable community."

For more information, see: http://www.charlestoncounty.org/departments/BuildingInspections/projectimpact.htm

Volunteers install fencing to capture sand and create protective dunes on Folly Beach, SC (Charleston Project Impact).

Galveston County Recovery from Hurricane Ike Has Lessons to Share.

Galveston County, TX, is no stranger to storms. More than 75 big storms and hurricanes have been recorded there in the past 135 years. In fact, Galveston was the scene of the nation's worst natural disaster in 1900, when a surprise storm killed between 6,000 and 12,000 people. Galveston folk have a lot to share about how to live with Mother Nature's bad moods. They are adapting to their coastal homeland by elevating and strengthening homes, planning together, educating themselves, safeguarding their unique environment, and pulling back from the coast.

"Build high and strong." That's advice from Frank Billingsley, chief meteorologist with Houston's KPRC-TV. "And build back smarter and better," he told Galveston County residents after Hurricane Ike in September 2008. Before the hurricane, when he custom built his first Galveston home, Frank followed his own advice for storm smart coastal building: use cement pilings; build higher than the minimum standard and stronger than the code; use hurricane straps, inside and out, as well as storm-resistant windows; clear out the ground level; and raise your utility boxes.

Elevating his home above the Hurricane Ike storm surge saved the house of this Galveston County home owner (FEMA photo).

Elevating his home above the Hurricane Ike storm surge saved the house of this Galveston County home owner (FEMA photo).

Green up. Neighbors are planning together to "green up," in more than one way. In the worst-damaged areas, they're working through their landmark recovery plan called the Bolivar Blueprint to restore storm destroyed native habitat, become an eco-tourism destination, and lure in businesses to boost the local economy.

Back up a little. With help from FEMA and the State of Texas, Galveston County is buying and clearing hundreds of houses that were decimated by Hurricane Ike. The idea behind the purchases, which are entirely voluntary, is to move back a bit from the coast to open up the beach, while elevating and strengthening other buildings. According to Greg Pekar, Texas State Hazard Mitigation Officer, "If Ike's brother comes back in 10 years, will we have more or less damage? Our assessment is that after the buyout there will be a lot less damage because the county will have acquired the most vulnerable properties."

For more information see: Breaking the Disaster Cycle on Bolivar Peninsula, Texas (FEMA 2010); www.gcoem.org; and KPRC.org.

'Louisiana House' Shows How to Build Safer, Stronger, Smarter

Smart homeowners in the southeast can rest easier the next time a hurricane churns in the Gulf of Mexico if they have heeded the advice of building experts at Louisiana State University.

The Louisiana House showcases ways to build wisely in the state's challenging environment (LSUagcenter.com).

Pat Skinner

The LSU AgCenter's Louisiana House (LaHouse) showcases ways to build in a land where floods, high winds, heavy rains, mold, and termites are common challenges. LaHouse exhibits scores of solutions for living with hurricanes, floods, and other hazards in ways that are healthy, practical, and safe. "As you build, restore, or rebuild in South Louisiana, take the time to understand what is happening along our coast and what that means to you," says Pat Skinner, disaster recovery and mitigation specialist at the LSU AgCenter. Their Build Safer, Stronger, Smarter campaign is simple: "Do it right, accept that hurricanes are a fact of life in South Louisiana. Get the facts about the risks you face in your location. And make the choice to build to reduce your vulnerability to these hazards."

Build strong, live well. LaHouse is a working model that puts into practice the concepts recommended by LSU experts. Visitors to LaHouse can learn how to build "fortified" homes using standard or advanced framing, SIPS (structural insulated panels), and ICF (insulating concrete forms). Visitors can see how to manage crawl spaces, piers, and slab foundations, and how—even during a storm—to hold on to their "hip," impact-resistant roofs of metal or concrete tile that looks like clay.

Refuge from the storm. The house is elevated three feet above the regulatory flood level; the teaching center is dry-floodproofed. The master bedroom closet is a storm shelter (engineered to withstand 150 mph). Sheathing, hurricane straps, and anchor bolts connect roof to walls to foundation, holding the whole house together, even in a stiff wind. Windows and doors are impact-resistant or shuttered. Landscaping is planned for low impact and sustainability.

Saving energy, money, and trouble. Recommendations for durability create energy efficient buildings too, and may even result in insurance premium discounts. "By following these and other ideas, homeowners will likely have more money in their pockets," Skinner says, "because their smart construction avoided expensive damage, saved energy, and helped protect the priceless Louisiana environment."

For more information see: www.lsuagcenter.com/LaHouse

The LSU Ag Center and LaHouse have excellent, free educational materials. (LSUagcenter.com).

Seattle Volunteers Train Homeowners to Make Homes Earthquake Safe

Since 1998, Seattle volunteers have been teaching residents how to retrofit their homes to withstand earthquakes. Thousands have taken free classes in libraries throughout the region. Hundreds of buildings were retrofitted with both structural and nonstructural improvements in the first few years of the project.

The LSU Ag Center and LaHouse have excellent, free educational materials. (LSUagcenter.com).

Roger Faris

The 2001 earthquake. A test came without warning when the 2001 Nisqually Earthquake hit the area and proved the retrofits' value. "We saw quickly that not only was damage successfully prevented, but lives had been saved as a direct result of the work of these volunteers, energetic home owners, and trained contractors," said Roger Faris, who helped organize and manage the project.

The power of partnerships. "While our group was inspired by the proof that the work is critically important, we were also confronted with growing evidence that our region will experience even bigger earthquakes in coming years," Faris said. "There is a long-term need to make homes and buildings stronger and safer." The Seattle home retrofit program started with federal seed money through the FEMA sponsored Project Impact initiative. Now the project is being continued by volunteers and other partners. It's a cooperative effort by emergency managers, building officials, technical experts, and experienced contractors who freely share their time, even if they're training their potential competition," Faris said.

The value of hazard mitigation. "A visitor today might well find once quiet neighborhoods echoing with rotohammers drilling into concrete and air powered equipment firing common nails into sheerwall panels," Faris said. Thirteen years after the project began, the free classes continue throughout the Puget Sound area, as volunteer experts teach homeowners and contractors how to anchor, brace, and take other steps to improve the safety of homes, schools, and day care centers. "In the Pacific Northwest, the value of true public and private hazard mitigation–actions to reduce disaster losses–has become a well-established fact," Faris said. "It demonstrates the importance of long-term commitment and sustained action to cut the destruction and disruption–and even death–that disasters cause."

PHINNEY NEIGHBORHOOD ASSOCIATION

Classes were developed in partnership with the Phinney Neighborhood Association.

For more information: See seattle.gov/emergency/prepare/personal/home.htm

StormSmart Coasts Offers How-to Tips and Peer-to-Peer Networking

Looking for information about living in harmony with a coastal zone environment? A good place to start is a free service called StormSmart Coasts. Formed in Massachusetts, StormSmart Coasts is now active in Florida, Alabama, Mississippi, Louisiana, Texas and Rhode Island, and will be coming soon to other states.

Living on the water's edge can be challenging in beautiful sites such as Mattapoisett, MA (StormSmartCoasts.org).

The StormSmart Coasts program is designed to help coastal communities address the challenges arising from storms, floods, sea level rise, and climate change. Sponsored by the EPA, NOAA, the Gulf of Mexico Alliance, and others, the program provides a menu of tools for successful coastal floodplain management.

Coastal Landscaping. Wind, salt spray, waves, and marshlands are part of the experience of living on the coast, but they also present special challenges. Using the right plants can not only reward the gardener but also help stabilize and protect the environment, according to StormSmartCoasts. Wisely selected and placed plants can reduce maintenance cost, enhance wildlife habitat and natural beauty, and provide erosion control and pollution buffers.

Beach plum (Mass.gov/CZM)

National communications network. For more information and the invaluable benefits of communicating with your peers across the nation, StormSmart Coasts has established a free networking service called StormSmart Connect. Those who sign up at http://stormsmart.org/ can share contacts, knowledge, and inspiration across the country. The network helps coastal decision makers connect, collaborate, and share the latest and best information on how to protect their communities from weather and climate hazards. Available communication tools include forums, groups, and hosted community or group websites.

The site shows benefits of "freeboard," raising a coastal house above flood levels (StormSmartCoasts.org).

Nonstructural mitigation. One way to reduce disaster damage is to elevate homes above flood levels. Elevating a home can reduce flood insurance costs, substantially decrease the chances a home will be damaged by storms and flooding, and help protect against sea level rise, according to StormSmart Coasts.

For more information: http://stormsmartcoasts.org/

Tampa Area Is Planning Now to Survive & Recover from Next Hurricane

When the next hurricane comes toward Tampa, Gene Henry will be ready. As hazard mitigation manager for Hillsborough County, FL, which includes Tampa, Henry has been working for years with his community to prepare for storms and other disasters. Other vulnerable coastal areas can learn from Hillsborough County. This fact sheet describes some of their programs.

Hillsborough County, Florida, encourages hazard mitigation, including elevation of homes in safe sites, planning, and public education (HillsboroughCounty.org).

Evacuation zones and surge markers. Hillsborough County communities have identified five evacuation zones, all subject to storm surge. "Coastal storm surge could extend as far as three miles inland," Henry said, "and could be as much as 13 to 17 feet above ground level. That's high enough to completely cover a one-story house." To demonstrate what this means, Hillsborough County has posted 30 storm surge signs markers in prominent locations with major storm surge risk. The signs are part of an aggressive public education campaign about preparedness and hazard mitigation.

Building codes and safer buildings. Hillsborough County encourages homeowners and builders to build safer, stronger homes and businesses. "We encourage people to install hurricane straps to secure their roofs and walls," Henry said. "Storm shutters can prevent damage from flying debris. We also recommend elevating the main breaker or fuse box above flood levels, keeping drains clear, maintaining flood insurance in floodprone areas, and developing personal preparedness plans, including business continuity plans."

Priority disaster recovery areas. Hillsborough is planning now for the community's recovery from its next big disaster. "As we watched New Orleans struggle with very difficult decisions after Hurricane Katrina, it was clear to us that we need to pre-plan how we will recover during the terrible times after a disaster," Henry said. "Our plan identifies how our community will redevelop and recover. It emphasizes seizing opportunities for building back better and improving our community." This landmark plan recognizes that there will not be enough resources to redevelop all areas simultaneously, so it targets Priority Redevelopment Areas, in zones with the least risk, where rebuilding will be incentivized for sustainable and holistic recovery. The plan also targets resiliency projects for Vulnerable Priority Redevelopment Areas to encourage safe, sustainable recovery.

For more information: See http://www.hillsboroughcounty.org/pgm/hazardmit/

Appendix B

Developments Related to Nonstructural Mitigation in Coastal Louisiana

RESTORE THE MISSISSIPPI RIVER DELTA
NATIONAL WILDLIFE FEDERATION

Appendix B-1

The History and Status of Nonstructural Mitigation in Louisiana

Lead Author: Alessandra Jerolleman

RESTORE THE MISSISSIPPI RIVER DELTA

NATIONAL WILDLIFE FEDERATION

Climate change is predicted to bring stronger hurricanes, rising seas, changing weather patterns, and other effects. These trends will put increasing pressure on south Louisiana, a region already facing crisis level wetland loss and subsidence rates. Levees and other structural measures that reduce flooding hazards offer one set of tools for meeting these challenges. Another set of tools, often called "nonstructural measures," can be equally important. This appendix assesses the extent to which nonstructural measures have been adopted in coastal Louisiana and how their use can be further supported.

Study Area

The National Wildlife Federation commissioned a study to examine the extent to which coastal Louisiana parishes were adapting nonstructural hazard mitigation measures. The study looked at 20 parishes that fall within the nine coastal basins as defined by the Louisiana Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA): Ascension, Assumption, Calcasieu, Cameron, Iberia, Iberville, Jefferson, Lafourche, Livingston, Orleans, Plaquemines, St. Bernard, St. Charles, St. James, St. John, St. Martin, St. Mary, St. Tammany, Terrebonne, and Vermilion.

The coastal lowlands bounded by these parishes include two major components: (1) the Chenier Plain of southwest Louisiana and (2) the Deltaic Plain, which includes the Atchafalaya basin and almost all the land south and east of metro Baton Rouge, including metro New Orleans and Houma/Thibodaux. With the exception of natural or artificial river levees, elevation is low, rarely above 20 feet, and in some cases below sea level. The coastal zone covers approximately 14,913 square miles, of which 6,737 square miles are water and 8,176 square miles are land (LOSCO 2005).

The plain east of Vermilion Bay is comprised of wetlands that lack a distinct coastline. Instead, the plain gradually and unevenly transitions from freshwater wetland systems to brackish water wetlands, to saltwater wetlands, and eventually to open water. This region is rimmed by a fragile and intermittent chain of barrier islands.

There are many bodies of water interspersed throughout the study area, including lakes, bays, bayous and distributaries. The study area is an extremely productive region:

- marshes that sit along the North American Flyway serve as rest stops and nesting grounds for over five million migratory birds;
- the study area is the nation's largest producer of shrimp, oyster, and blue crab;
- the study area is known for its energy infrastructure, oil production, and national and international commerce;
- the world's second largest navigational port—the Port of New Orleans—is at the mouth of the Mississippi Delta. Combined with the other ports on the southern portion of the Mississippi River, this is the largest port system in the nation.

Additionally, the area is home to a complex and unique culture, which is tied to the natural environment. Many of the trades practiced in south Louisiana require proximity to the coast and have been in families for generations. Over 75% of Louisiana residents were born within the state, a percentage that exceeds that of any other state. The state has long been the home of Native Americans. In recent centuries, Louisiana was also settled by Acadians from Canada as well as French, Spanish, and Asian immigrants. Today, the region's culture is grounded in many ethnicities, including Vietnamese, Islenos, Cajun, Creole, and African-American.

In 2010, over 2 million residents (more than 47% of the state's population according to 2010 US Census) lived in Louisiana's coastal parishes. However most of these communities are well inland and away from the Gulf's edge. Very few communities in Louisiana can even see the Gulf of Mexico. Grand Isle, with a population of 1,541, is Louisiana's only inhabited barrier island. Port Fourchon is Louisiana's southernmost port and one of the few in Louisiana located adjacent to the Gulf (2011 State Mitigation Plan). Port Fourchon plays a key role in oil and gas production in the United States. Even so, LA Hwy 1 is the only supply line and main evacuation route for Port Fourchon residents and workers, and the road is regularly overtopped during high tides and storms. The fragility of this nationally important highway exemplifies the need to reduce hazards for crucial infrastructure.

Flooding in South Louisiana: Previous Policy Remedies

Throughout Louisiana's coast, flooding is caused by varying combinations of riverine and coastal effects. Thanks to levees built along major rivers, today floods in south Louisiana are rarely caused by high river water. Instead, local or regional rainfall events, severe storms, or tidal flooding are more common causes. Subsidence, coastal land loss, and poorly planned development have exacerbated these trends (2011 Mitigation Plan[1]). Together, these factors combine to make flooding a monumental problem throughout south Louisiana (2011 Mitigation Plan).

Early development in coastal Louisiana was concentrated along natural ridges, and prior to the 1940s many homes were raised above the historical floodplain. Communities of the past took the approach of living with the water; people knew floods would occur and built accordingly. In the 20th Century, however, several key pieces of legislation began to alter the national and local approach to water. The Lower Mississippi Flood Control Act of 1928 (70 USC 596) authorized the U.S. Army Corps of Engineers (USACE) to construct dams and levees to attempt to control flooding. The act was a response to the 1927 flood and established a precedent for the region's heavy reliance on levees.

The National Flood Insurance Act of 1968 (Pub. L. 90-448), which initiated the National Flood Insurance Program (NFIP), made federally subsidized insurance available in many flood prone regions for the first time. The NFIP requires that participating communities follow a minimal floodplain management standard, but the availability of subsidized insurance can serve to encourage development in areas that might otherwise remain in their natural states. Flood insurance is a key component of reducing flood risk; however, high flood insurance subsidies create a situation in which individuals do not realize or pay for their true risk.

[1]State of Louisiana Hazard Mitigation Plan. April 2011

More recently, the Association of State Floodplain Managers with the National Oceanic and Atmospheric Administration (NOAA) has issued its No Adverse Impact Toolkit, which advocates a "do no harm" approach to flood protection. No Adverse Impact Floodplain Management is an approach in which "the actions of one property owner are not allowed to adversely affect the rights of other property owners."[2] The No Adverse Impact approach incorporates nonstructural mitigation measures and promotes a far better floodplain standard than what is achieved through normal means.

Due to the modern day risk of flooding from various sources, large-scale development of significant portions of south Louisiana has only been possible through the construction of a combination of levees, flood walls, and forced drainage systems, coupled with flood insurance. Unfortunately, these systems of flood protection carry their own set of risks. As Hurricanes Katrina and Rita showed, levees and floodwalls can fail. During an extreme rain event or the failure or overtopping of a levee or flood wall, there is also the added risk of forced drainage system failure. This failure is most likely a result of either water volume exceeding pump capacity, or from pump failure due to mechanical failure, inundation, or power interruption (2011 Mitigation Plan).

Appendix B-2 provides a timeline of nonstructural hazard mitigation policies and initiatives, both national and local, dating from 1927 to the present.

[2]ASFPM. (2008). No Adverse Impact Floodplain Management

Problem Statement

Homeowners frequently experience damage from flooding to both the contents and physical structures of their homes. Flood risk reduction measures that property owners undertake themselves, also known as nonstructural mitigation, can be effective. However, most residents rely on government funded flood control structures (structural protection) or a combination of nonstructural and structural protection measures. This reliance on structural measures is a serious problem for the study area.

Coastal Louisiana has lost over 1.2 million acres of wetlands since the 1930s, and continues to lose land at the rate of 15,300 acres per year.[3] This loss is attributable to many factors, but the primary causes are the very levees upon which so many communities depend for flooding protection. The Mississippi River levees prevent the river from overtopping its banks each spring; this reprieve from annual flooding has allowed many communities of south Louisiana to flourish. However, without the fresh water and sediment provided by the river's annual flood, the deltaic wetlands do not receive the materials they need to rebuild. Other coastal levees alter the flow of water in more subtle ways, further harming vegetation and animal species.

Already prone to subsidence and prey to salt water intrusion, the sediment starved wetlands have been disappearing for decades. Rising sea level and increasing frequency of hurricanes exacerbate the problem. Ironically, the same wetlands that are washing away are those that provide crucial storm buffering protection to south Louisiana communities. As a result of this combination of factors, coastal communities are as endangered as the Louisiana coast itself.

The over reliance on levees has left Louisiana extremely vulnerable, with economic, emotional, and social repercussions being experienced every time floodwaters encroach. Louisiana receives a great deal of federal money for flood damage: an average of $198 million to $682 million spent per year (FEMA[4]). This does not include federal dollars spent through other agencies, such as HUD, on recovery efforts. Federal, local and private funds are frequently spent on recovery efforts, whether due to massive flooding or more routine shallow inundation.

[3]LA Comprehensive Master Plan. 2007.

[4]www.fema.gov/areyouready/flood.shtm

As with all flood prone communities, these payments externalize the costs, allowing coastal communities to reap some of the immediate benefits of unwise development without paying the true costs of the ensuing disaster losses. For example, a community may gain immediate tax revenue through unwise development, while depending on the federal government for disaster assistance once that development is impacted by a natural hazard such as a flood. Externalization of costs and other factors that separate natural and logical consequences from the act of unwise development are prime impediments to the long term vitality of the region.

Given the history of losses, coastal residents now have "… greater awareness of how weather events translate into extended economic vulnerabilities from infrastructure damage, business interruption, loss of investment capital and property loss."[5] Still, there is strong local support for structural mitigation with a focus on levees, a protection strategy that is increasingly viewed as unsafe and unaffordable. Levees are constructed to a particular design level, and fail when that level is exceeded, bringing catastrophic consequences. Finally, the high cost of levee operation, maintenance, and repair puts a strain on Louisiana's budget, given that the state is often responsible for these expenditures.

But there are other options for handling flooding risk. Measures such as land use planning and elevation of structures can help reduce flood loss damages without the large costs involved in levee construction. Such nonstructural measures can, in turn, spur lower flood insurance premiums and allow these dollars to be reinvested in local communities.

In summary, in order to protect the future of coastal Louisiana, it is necessary to use a combined approach, one that includes structural, nonstructural and coastal restoration[6] activities. Furthermore, given the cost of structural mitigation, nonstructural options may reduce the level of protection requirements and make structural projects more affordable. In fact, in some rural areas, with government funds for structural measures scarce, nonstructural approaches may be the only immediately available option.[7]

[5]Norris-Raynbird, Carla (2011). *Local CZM Capacity Pre and Post Hurricanes Katrina, Rita, Gustav and Ike: A Comparison Study.*

[6]Coastal Restoration can be considered a nonstructural measure.

[7]The 2012 update of the State Plan is taking this into consideration.

Current Status of Nonstructural Mitigation Adaptation: Study Methodology

In order to make sound recommendations, we needed to understand how nonstructural measures were being implemented. To establish this baseline, the National Wildlife Federation engaged experienced researchers to gather local data from a wide range of available primary and secondary sources. The researchers collected information specific to each of the 20 coastal parishes within the study area. This information included a series of interviews with individuals within the communities, a review of readily available plans and Community Rating System (CRS) data, as well as a review of each parish's website, news available on the website, and articles from online newspapers accessible from the Internet.

The research team also reviewed proceedings from local conferences and workshops relevant to nonstructural hazard mitigation. Finally, the team conducted a literature review of academic resources, particularly research about the Louisiana coast. A partially annotated bibliography of relevant academic publications can be found in Appendix I. The bibliography includes a wide range of topical areas such as: resilience, attachment to place, and participatory planning. A lengthier discussion of the study methodology can be found in Appendix G.

Current Status of Implementation of Nonstructural Mitigation – Summary of Findings

The study area has experienced significant flooding losses in recent years, and this has led coastal residents to have a greater awareness of potential impacts to their region's economy, infrastructure, community, and properties. Yet in spite of the history of flood loss, and in the face of a high level of flood risk, the region's once active culture of proactive adaptation is not reflected in the comments and information our researchers gathered. Most people speak of hazards only in the context of major disasters, such as hurricanes, and their ideas about preparing for such hazards focus mainly on levees. While some are aware of programmatic measures, such as land use planning and code adoption and enforcement, most people stress the need for physical measures such as levees or home elevation when they are asked about flood protection.

Funding and construction of these mitigation measures are, in many cases, seen as public rather than as personal responsibilities. Communities and individuals are seen as having minimal responsibility for mitigation, perhaps contributing to a culture that denies risk. This is reflected in attitudes about land use planning and building codes. While many residents and local officials understand the important role these measures play in reducing risk, they remain politically controversial. At the same time, state and federal stakeholders are increasingly aware of and challenged by the high cost and technical limitations of large structural protection measures.

Some regions of south Louisiana recognize that a different mindset is needed. For example, 25 communities along the Louisiana coast are working toward reducing flood losses and lowering flood insurance premiums by actively implementing programs to exceed the minimum criteria for the National Flood Insurance Program (NFIP). These communities show high levels of interest and performance in providing flood map information, conducting outreach projects, making flood protection information available, providing one-on-one assistance, and maintaining drainage systems. These initiatives offer hope for the region's long-term resilience.

In addition, many local, regional and national groups are actively working on these issues, including:

- The Center for Planning Excellence (CPEX), which has published a Land Use Planning Toolkit. This document consists of a model set of development regulations focused on sustainability and tailored to local Louisiana government officials who wish to make wise land use decisions.
- Bayou Interfaith Shared Community Organization (BISCO operates primarily in Terrebonne and Lafourche parishes. BISCO has been very involved in hurricane recovery issues such as housing and in discussions of coastal land loss.
- Louisiana Sea Grant, based at the Louisiana State University and part of the national extension network, has strategic initiatives to address four issues identified as pertinent to state, regional, and national needs: healthy coastal ecosystems, sustainable coastal development, safe and sustainable seafood, and hazard resilience in coastal communities. The research and projects conducted by Sea Grant make them a key partner in nonstructural climate change adaptation.

A listing of these groups and organizations can be found in Appendix E. The research team conducted a review of these organizations and programs in order to establish their areas of intersection. The results of this review are presented in Appendix F, which show partnerships, sources of funding, geographical coverage, and types of organization. The research team found that while many organizations do work together, there are also several organizations and projects with similar goals that are not necessarily integrated. The work of so many organizations and projects in support of nonstructural hazard mitigation is a positive finding, but the integration of these efforts is key to their overall success.

Overall the research indicates that there is growing interest in some types of nonstructural meaures, but we need a broader understanding of these measures, improved coordination in providing tools to communities, lessened dependence on levees, and a greater amount of personal and community responsibility. As Appendices E and F show, there are a great many groups actively working on these issues. By working together, and capitalizing upon slowly growing public acceptance, it may be possible to see significant increases in coastal Louisiana's ability to prepare for and adapt to flooding hazards.

Appendix B-2

Developments Related to Nonstructural Mitigation in Coastal Louisiana (Timeline)

RESTORE THE MISSISSIPPI RIVER DELTA
NATIONAL WILDLIFE FEDERATION

1927	MAY	Mississippi River Flood
1928	MAY	Lower Mississippi Flood Control Act of 1928
1936	JUNE	Flood Insurance Act of 1936
1942	JUNE	*"Human Adjustments to Floods,"* Gilbert F. White
1960	JULY	Flood Control Act of 1960
1965	SEPTEMBER	Hurricane Betsy
1966	AUGUST	Executive Order 11296 – Guidelines for Water Resource Council
1968	AUGUST	• National Flood Insurance Act of 1968 • Rivers & Harbors Act of 1968
1969	AUGUST	Hurricane Camille
1972	OCTOBER	Coastal Zone Management Act of 1972
1974	MARCH	Water Resources and Development Act of 1974
	NOVEMBER	USACE begins draft report regarding nonstructural hazard mitigation
	CONTINUE	

COMPARISON OF FLOOD PROTECTION APPROACHES

- Disasters
- Legislation
- FEMA Related
- Publications
- Other Significant Events

RESTORE THE MISSISSIPPI RIVER DELTA

NATIONAL WILDLIFE FEDERATION

1976	APRIL	*"Everything in its Path: Destruction of Community in Buffalo Creek Flood,"* Kai T. Erickson
	JULY	USACE's 1st seminar on nonstructural mitigation, Fort Belvoir, VA
1977	MAY	• Executive Order 11296 (from 1966) revoked • Executive Order 11990 – Protection of Wetlands • Executive Order 11988 – Floodplain Management
1978	FEBRUARY	*"Floodplain Management Guidelines for Implementing E.O. 11988,"* Water Resources Council
1979	MARCH	Executive Order 12127 – FEMA established
1981	SEPTEMBER	• *"FEMA 015 Design Guidelines for Flood Damage Reduction"* • *"FEMA 055 Coastal Construction Manual (1st edition)"*
1982	OCTOBER	Coastal Barrier Resources Act of 1982
1984	MARCH	*"FEMA 054 Elevated Residential Structures"*
1985	NOV	USACE establishes the National Nonstructural Flood Proofing Committee
1986	MAY	*"FEMA 102 Floodproofing Non-Residential Structures"*
1987	FEBRUARY	*"FEMA 116 Reducing Losses in High Risk Flood Hazard Areas: A Guidebook for Local Officials"*
	CONTINUE	

COMPARISON OF FLOOD PROTECTION APPROACHES

- Disasters
- Legislation
- FEMA Related
- Publications
- Other Significant Events

1988	AUGUST	*"Flood Proofing Tests – Test of Materials and Systems for Flood Proofing,"* USACE
1990	APRIL	*"Topic Paper #3 – Issues to Floodproofing Retrofitting,"* ASFPM
1992	AUGUST	Hurricane Andrew
1993	FEBRUARY	*"Recovery After Disaster: Achieving Sustainable Development,"* Berke, Kartez & Wenger
	APRIL-AUGUST	Midwest Flood
	JULY	*"Floodproofing: How to Evaluate Your Options,"* USACE
	OCTOBER	Disaster Relief & Emergency Assistance Act of 1993 ("Stafford Act") created the Hazard Mitigation Grant Program
1994	JANUARY	*Unified National Program (UNF) for Floodplain Management Report,"* Federal Interagency Floodplain Management Task Force
	MAY	*"National Mitigation Strategy,"* FEMA
	JUNE	• *A Blueprint for Change Sharing the Challenge: Floodplain Management in the 21st Century*, Interagency Floodplain Management Review Committee ("Gallway Report") • *"Local Flood Proofing Programs,"* USACE (updated in 2005)
	SEPTEMBER	National Flood Insurance Reform Act of 1994 – amended the Flood Disaster Protection Act of 1973
	OCTOBER	*"FEMA 257 Mitigation of Flood and Erosion Damage to Residential Buildings in Coastal Areas"*
	CONTINUE	

COMPARISON OF FLOOD PROTECTION APPROACHES

Disasters
FEMA Related
Other Significant Events
Legislation
Publications

RESTORE THE MISSISSIPPI RIVER DELTA
NATIONAL WILDLIFE FEDERATION

1995	MAY	*"Natural Hazard Reduction and Sustainable Development: A Global Assessment,"* Journal of Planning Literature
1996	JUNE	• *"Flood Proofing Techniques, Programs, and References," USACE* • *"FEMA 268 Protecting Floodplain Resources: A Guidebook for Communities"* • *"FEMA 309 Addressing Your Community's Flood Problems: A Guide for Elected Officials"*
1997	FEBRUARY	Coastal Wetlands Protection and Restoration Act of 1997 ("Breaux Act")
	APRIL-MAY	Red River Flood
	MAY	*"Strategic Planning Workbook for Organizations: Revised and Updated,"* St. Paul Amherst H. Wilder Foundation
1998	JUNE	• *"FEMA 348 Protecting Building Utilities from Flood Damage"* • *"FEMA Homeowner's Guide to Retrofitting"* updated
	JULY	• *"Higher Ground: A Report on Voluntary Buyouts in the Nation's Floodplains,"* NWF • *"Cooperating with Nature. Confronting Natural Hazards with Land-Use Planning for Sustainable Communities,"* Raymond Burby
	OCTOBER	*"FEMA 317 Property Acquisition Handbook for Local Communities"*
1999	MAY	ASFM's 1st Annual National Flood Proofing Conference, Baton Rouge, LA
	JUNE	*"Community-based Disaster Management During the 1997 Red River Flood in Canada,"* Disasters, Buckland & Rahman
	OCTOBER	• *"FEMA 015 Design Guidelines for Flood Damage Reduction"* • *"FEMA 055 Coastal Construction Manual (1st edition)"*
	CONTINUE	

COMPARISON OF FLOOD PROTECTION APPROACHES

- Disasters
- Legislation
- FEMA Related
- Publications
- Other Significant Events

1999	DECEMBER	Public Entity Risk Institute (PERI) publishes its earliest advocacy pieces for nonstructural hazard mitigation practices
2000	MARCH	*"Losses Avoided in Birmingham Alabama,"* FEMA
	MAY	*"FEMA 347 Above the Flood: Elevating Your Flood Prone House"*
	JUNE	*"FEMA 55 Coastal Construction Manual: Principles and Practices of Planning, Siting, Designing, Constructing, and Maintaining Residential Buildings in Coastal Areas,"* 2 volumes
	OCTOBER	Disaster Mitigation Act of 2000 – amended the Stafford Act
2001	JUNE	• *"FEMA 259 Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures"* • *"FEMA Flood Hazard Mitigation Handbook for Public Facilities"*
	OCTOBER	*"Nonstructural Flood Damage Reduction Within the U.S. Army Corps of Engineers,"* Journal of Contemporary Water Research & Education, Universities' Council on Water Resources
	NOVEMBER	• Term "No Adverse Impact" coined in a 2001 Natural Hazards Review article by Larry Larson and Doug Plasencia • *"No Adverse Impact Toolkit,"* ASFM and NOAA.
2002	APRIL	*"Swamping Louisiana,"* National Wildlife Magazine, NWF
	APRIL	*"Promoting Mitigation in Louisiana: Performance Analysis,"* FEMA Region IV
2003	MARCH	*"Measuring Sustainability - Learning from Doing,"* Bell and Morse
	CONTINUE	

COMPARISON OF FLOOD PROTECTION APPROACHES

Disasters
Legislation
FEMA Related
Publications
Other Significant Events

RESTORE THE MISSISSIPPI RIVER DELTA
NATIONAL WILDLIFE FEDERATION

2003	JULY	"Coastal Engineering Manual (CEM)," USACE
	AUGUST	*"Vulnerability as a Measure of Change in Society,"* Journal of Mass Emergencies and Disasters, Greg Bankoff
2004	JANUARY	Flood Insurance Reform Act of 2004
	AUGUST	Hurricane Charley
	AUGUST	*"Hurricane Charley Nature's Force vs Structural Strength,"* IBHS
2005	JANUARY	*"Reducing Flood Losses through International Code Series (2003 I-Codes),"* FEMA
	MAY	*"Hurricane Mitigation Handbook for Public Facilities,"* FEMA
	JUNE	*"FEMA 511- Reducing Damage from Localized Flooding"*
	AUGUST	Hurricane Katrina
	SEPTEMBER	Hurricane Rita
	OCTOBER	Hurricane Wilma
	NOVEMBER	"Charting the Course for Rebuilding a Great American City: An Assessment of the Planning Function in Post-Katrina New Orleans," APA New Orleans Planning Assessment Team
	CONTINUE	

COMPARISON OF FLOOD PROTECTION APPROACHES

- Disasters
- Legislation
- FEMA Related
- Publications
- Other Significant Events

2006	JUNE	• *"HMGP Reconstruction Grant Pilot for Hurricanes Katrina, Rita and Wilma,"* FEMA • *"Expanding the Mitigation Toolbox: The Demolish/Rebuild Option,"* ASFPM
	JULY	*"FEMA 549- Hurricane Katrina in the Gulf Coast: Mitigation Assessment Team Report, Building Performance Observations, Recommendations, and Technical Guidance"*
2007	JANUARY	2007 LA State Uniform Construction Code adopted
	JANUARY	• *"FIA-15 National Flood Insurance Program (NFIP) Community Rating System (CRS) Coordinator's Manual"* • *"FEMA 543 Design Guide for Improving Critical Facility Safety from Flooding and High Winds: Providing Protection to People and Buildings"*
	MARCH	• "FIA-15 National Flood Insurance Program (NFIP) Community Rating System (CRS) Coordinator's Manual," FEMA • "FEMA 551 Selecting Appropriate Mitigation Measures for Floodprone Structures"
	APRIL	FEMA publishes a Loss Avoidance study for Southern California.
	APRIL	ASFPM holds conference, *"Gulf Coast Recovery: Mission Mitigation"*
	MAY	• *"No Adverse Impact in the Coastal Zone,"* ASFPM • *"Louisiana Speaks Regional Plan: Visions and Strategies for Recovery and Growth in South Louisiana,"* Louisiana Recovery Authority (LRA)
	JUNE	*"FEMA 577 Design Guide for Improving Hospital Safety in Earthquakes, Floods, and High Winds: Providing Protection to People and Buildings"*
	AUGUST	Make It Right Foundation established by Brad Pitt
	CONTINUE	

COMPARISON OF FLOOD PROTECTION APPROACHES

- Disasters
- FEMA Related
- Other Significant Events
- Legislation
- Publications

2007	DECEMBER	• *"National Flood Insurance Program (NFIP) Community Rating System (CSR): A Local Official's Guide to Saving Lives, Preventing Property Damage, and Reducing the Cost of Flood Insurance,"* FEMA • *"Reducing Flood Losses through International Code Series (2006 I-Codes),"* FEMA
2008	MARCH	USACE delivered its implementation strategy for Louisiana Coastal Protection and Restoration (LACPR) project
	APRIL	The State of Louisiana integrated three components in its Strategic Hazard Mitigation Plan: structural measures including levees, floodwalls, gates and weirs; coastal restoration measures including wetlands and marsh; and nonstructural measures, including relocation, elevation, and hardening.
	MAY	Natural Hazard Mitigation Association formed
	JUNE	*"Louisiana Coastal Mitigation Guidebook,"* Louisiana Sea Grant College Program
	AUGUST	*"User's Guide to Technical Bulletins: Developed in accordance with the National Flood Insurance Program,"* FEMA
	OCTOBER	*"Loss Avoidance Study: Sonoma County, California Elevated Structures,"* FEMA
	OCTOBER	*"Community Elevation Conversations,"* PERI and CHART
	OCTOBER	Dutch Dialogues workshops convened
	NOVEMBER	ASFPM National Floodproofing Conference held in New Orleans
2009	JANUARY	*"Loss Avoidance Study: Wisconsin, Property Acquisition and Structure Demolition,"* FEMA
	CONTINUE	

COMPARISON OF FLOOD PROTECTION APPROACHES

Disasters
Legislation
FEMA Related
Publications
Other Significant Events

2009	APRIL	*"Loss Avoidance Study: Northern California Flood Control Mitigation,"* FEMA
	JUNE	USACE delivers its final implementation strategy for Louisiana Coastal Protection and Restoration (LACPR) project
	DECEMBER	*"FEMA 312- Homeowner's Guide to Retrofitting: Six Ways to Protect Your House from Flooding"*
2010	APRIL	*"Hazard and Resiliency Planning: Perceived Benefits and Barriers Among Land Use Planners, Final Research Report,"* NOAA's Coastal Services Center
	NOVEMBER	*"2011-2014 Strategic Plan,"* FEMA
	DECEMBER	*"FEMA P-424, Design Guide for School Safety Against Earthquakes, Floods and High Winds,"* updated from 2004 and included as part of the Risk Management Series.
2011	DECEMBER	Presidential Policy Directive 8: National Preparedness (PPD8)
	MAY	• Flooding along the Mississippi River creates federally declared disaster areas • Morganza Spillway opened for the first time in 37 years
	AUGUST	Hurricane Irene
	SEPTEMBER	Tropical Storm Lee
	NOVEMBER	*"Design for Flooding: Architecture, Landscape and Urban Design for Resilience to Climate Change,"* Watson and Adams
	NOVEMBER	*"National Disaster Recovery Framework,"* FEMA
	END	

COMPARISON OF FLOOD PROTECTION APPROACHES

- Disasters
- FEMA Related
- Other Significant Events
- Legislation
- Publications

RESTORE THE MISSISSIPPI RIVER DELTA

NATIONAL WILDLIFE FEDERATION

Appendix C

Legal Issues Associated with Nonstructural Mitigation

Lead Author: Ed Thomas

RESTORE THE MISSISSIPPI RIVER DELTA
NATIONAL WILDLIFE FEDERATION

This appendix outlines legal issues that government officials in coastal Louisiana should understand as they work to plan and implement nonstructural climate change adaptation and hazard mitigation measures. The legal case for such measures is strong. Courts have generally upheld the right of governments to prevent harm, such as flooding. When governments act in a fair and uniform manner to prevent harm, courts almost universally uphold their actions. In fact, governments have been held liable for failing to enact harm prevention measures. A discussion of these issues and how they affect implementation of nonstructural measures can be found below.

- The purpose of government is: "... to restrain people from injuring one another." [Former Governor of Massachusetts, and former United States Attorney, William Weld, in an interview in the New York Times Magazine, Interview with Deborah Solomon, October 2, 2005.]
- "When regulation prohibits wrongful uses, no compensation is required." [Testimony of Roger Pilon, senior fellow and director, Center for Constitutional Studies, Cato Institute. Before the Subcommittee on Constitution, Committee on Judiciary, US House of Representatives, February 10, 1995.]
- "Government is vastly more likely to be sued, and successfully sued, for permitting development which causes harm than for taking action to regulate land use, development, and building so as to prevent harm." [Testimony of land-use expert witness, Attorney Edward A. Thomas, before the State of Colorado Water Conservation Board, November 10, 2010.]

Background

When disaster strikes, who pays for the damage incurred? When Mother Nature's natural processes cause harm to property, an individual who suffers damage can pay for the reconstruction of his property in three ways:

- Self-Help. Rebuilding by the injured party on her own—using savings, borrowed money, assistance from national and local charities, and the help of friends and neighbors—was once common throughout the United States. Today, this tradition survives in such communal situations as helping a neighbor rebuild a barn destroyed by lightning.
- Insurance. Casualty insurance can provide an efficient mechanism for recovery, whether the insurance is purchased by the damaged party or made available through a special legislatively created mechanism, as is the case for Workers' Compensation Insurance. State and federal disaster relief grants are another form of special, legislatively established social insurance for disaster victims.
- Litigation. Beyond self-help and insurance, litigation is the only remaining alternative for recovery when a person suffers damage. Successful litigation requires demonstrating that a person, corporation, or agency caused, or somehow is legally culpable for the damage that has taken place.

Sometimes recovery mechanisms can be linked together. For example, disaster assistance in the United States is typically a combination of self-help (via disaster loans) and insurance (via special legislation that both authorizes and subsidizes such loans). Each of these three mechanisms has distinct advantages and disadvantages, as well as widely varying degrees of efficiency, depending on the particular circumstance.

- Self-help worked well in the past and still does, in specific situations. For optimal use of this mechanism, the community must be committed to helping each other in times of difficulty. This form of recovery cannot work well if most of the helpers are themselves suffering damage.

- Insurance can be an extremely efficient mechanism for distributing funds, provided the individuals damaged possess a sufficient amount of insurance or have been provided such insurance by operation of law. The downside of insurance is that a person must generally purchase a policy prior to damage. Experience has shown that people will generally not purchase insurance for infrequent events such as earthquakes and floods absent a government requirement. Even when the government does require insurance, compliance is an issue.

- Litigation is inefficient. Not only does it take many years, but litigation has huge costs that go not to the damaged party but to attorneys, courts, expert witnesses, court recorders, and others. Litigation is also uncertain. The damaged party may not be able to obtain counsel or find a culpable entity. Sometimes a plaintiff will not recover damages because the defendant can hire clever expert witnesses and/or attorneys. For all of these reasons, litigation is the least reliable of the three methods discussed.

Key Legal Issues

The issues below are some of the most likely to arise when hazard mitigation measures are being considered. These examples underscore the basic point of this paper: governments will not necessarily be sued for diligent efforts to protect people. In fact, governments may be sued if their actions are not found to be diligent enough.

"Taking." The National Oceanic and Atmospheric Administration (NOAA) recently completed a study, prepared by Booz Allen Hamilton, which surveyed planners in the United States about impediments to ensuring safe development through regulation. [See: "Hazard and Resiliency Planning: Perceived Benefits and Barriers Among Land Use Planners, Final Research Report," National Oceanic and Atmospheric Administration Coastal Services Center, April 2010.] Two major impediments to regulation were cited in that report: fear of "taking" issues and economic pressures.

There are real concerns about regulating property in high risk areas such as floodplains or canyons subject to wildfire. Perhaps the greatest difficulty is that floodplain development produces many more tax benefits to local governments compared to less desired property. Government employees also have concerns about being sued for taking regulatory action and having the court find their action to be an unconstitutional "taking" of property. This fear is easily exploited by those who wish to develop a site without regard for the property rights of others. However, when a government entity acts in a fair and uniform manner to prevent harm, courts almost universally uphold the right, and even the duty of governments to act.

For additional information on the subject of takings, see:

- "Mitigating Misery: Land Use and Protection of Property Rights Before the Next Big Flood." Authors: Edward A. Thomas Esq. and Sam Riley Medlock JD. Vermont Journal of Environmental Law, Vol. 9, 2008. Law Review Article on the National Flood Insurance Program and the concept of No Adverse Impact Floodplain Management. http://www.floods.org/PDF/Mitigation/ASFPM_Thomas&Medlock_FINAL.pdf
- "No Adverse Impact and The Courts: Protecting the Property Rights of All." Authors: Dr. Jon Kusler Esq. and Edward A. Thomas Esq., Edition of November 2007. http://www.floods.org/PDF/ASFPM_NAI_Legal_Paper_1107.pdf

Immunity. Many local government officials believe they are immune from liability even if their action or inaction causes harm to others. The defense of immunity is frequently raised by government agencies, at all levels, when individuals claim that they have suffered harm due to government action or inaction. Recent case law shows that these claims are not ironclad, particularly when issues of flooding come into play.

Possibly the most prominent example of this belief was reflected by California state officials who claimed that the state and individual officials were immune from damages caused by the failure of levees. Officials in California had good reason to believe that their state was not liable. For many years, California courts had consistently held that the state was immune from such damages. In 2003, however, following 18 years of litigation, the California courts held the state liable for some $464 million in damages due to the failure of a levee. [See PATERNO v. STATE, C040553, (Cal.App.4th 2003)].

In a case before the Idaho Supreme Court, it was found that the failure of the City of Des Moines to follow its emergency plan, to the great harm of a nearby manufacturing facility, overcame the city's claim of immunity. The court held that: "We conclude that the City's decisions concerning how to fight the flood do not fall under the discretionary function exception to liability under Iowa Code section 670.4(3) of Iowa's Tort Liability of Governmental Subdivisions Act.... [See Keystone Elec. Mfg. Co. v. City of Des Moines, 586 N.W.2d 340, 343 (Iowa 1998)].

Numerous legal issues can be discussed with respect to levees, dams and other structures whose potential failures pose a significant risk to life and property. See: "Liability for Water Control Structure Failure Due to Flooding," Thomas, E.A., Association of State Floodplain Managers, November 2006." http://www.floods.org/PDF/NAI_Liability_Failure_Facilities_0906.pdf

While this paper could be updated to include more in-depth analysis of more recent court cases, including Hurricane Katrina related litigation, it still represents an excellent analysis of the tremendous legal liability associated with levees, dams, and other structures that pose a significant threat to life and property when they fail.

For a discussion of the major litigation resulting from the devastation following Hurricane Katrina, see:

- "Recovery Following Hurricane Katrina: Will Litigation and Uncertainty Today Make for an Improved Tomorrow?" Thomas, E.A. in the National Wetlands Newsletter, vol. 29, no. 5. Copyright © 2007 Environmental Law Institute.® Washington D.C.; http://www.floods.org/PDF/ET_Katrina_Insurance_082907.pdf
- "The Three Katrinas: Hard Cases Make New Law," Houck, O., in the National Wetlands Newsletter, vol., 32 no. 4. Copyright © 2010 Environmental Law Institute.® Washington D.C.

Evacuation. There are numerous legal cases involving evacuation, especially in Louisiana following Hurricane Katrina. Possibly the most prominent was the criminal case brought against Sal and Mabel Mangano, the husband and wife owners of St. Rita's Nursing Home in St. Bernard Parish, just outside of New Orleans. While the defendants were acquitted of criminal liability, many other cases of civil liability have been pursued, often successfully, against hospitals and nursing homes for failure to develop proper plans or for failure to carry out those plans. [See: e.g., CASE COMMENT: "Differentiating Medical Malpractice and Personal Injury Claims in the Context of Statutory Protections: LaCoste v. Pendleton Methodist Hosp.," L.L.C.Journal of Health & Biomedical Law Suffolk University Law School, Journal of Health & Biomedical Law, 3 J. Health & Biomed. L. 367, 368-375 for a discussion of the comparison of medical malpractice and premises liability for death and injury in medical facility evacuation; See: Berthelot v. Patients' Comp. Fund Oversight Bd., 977 So. 2d 967 (La.App. 1 Cir. 2007) for a case involving the difference between medical malpractice and premises liability].

A May 4, 2011, decision by a Louisiana Court of Appeals, if not overturned on appeal, would hold that government, however, has complete immunity in providing or failing to provide promised emergency services, such as evacuation to mobility impaired individuals, under the Louisiana Homeland Security and Emergency Assistance and Disaster Act, La. Rev. Stat. Ann. § 29:735, in the absence of any evidence of willful misconduct. See: Cooley v. Acadian Ambulance, 65 So. 3d 192 (La.App. 4 Cir. 2011).

Climate Change or Variability. Regulations severely restricting the development and occupation of land need special attention. See: "Climate Change and Emergency Management: Adaptation Planning," Edward A. Thomas and Terri L. Turner, American Bar Association, Section of State and Local Government, State and Local Law and News, Vol. 34, No. 3, Spring 2011. http://www.americanbar.org/content/dam/aba/publications/state_and_local_law_news/sl_34_3_thomas_turner.authcheckdam.pdf

Zoning. Courts have long upheld the right of municipalities to zone property. Garrett v. Shreveport, 154 So. 2d 272 (La. Ct. App. 1963), for example, was a case involving a claim that zoning was an unconstitutional abrogation of property rights. In that case, the Louisiana Court of Appeals found that municipalities have a right to develop and enforce zoning under the Louisiana Constitution.

Building Codes. A building code, like any municipal ordinance, is presumed constitutional. While the governing body does not have unlimited authority to regulate the lives of its citizens, it may enact laws reasonably related to promotion or protection of public health, safety and welfare. So long as a real and substantial relationship exists between the regulation and the promotion and protection of the public good, public health or safety, such regulations are almost universally found by the courts to be an inherent part of the state's authority. Courts will generally interfere with the action of the governing authority only when it is plain and palpable that such action does not have real or substantial relation to the public health, safety, or general welfare.

See, e.g., Ferrara v. City of Shreveport, 702 So. 2d 723 (La. App. 2 Cir. Sept. 24, 1997) and Kalbfell v. St. Louis, 357 Mo. 986 (Mo. 1948) in which the Missouri Supreme Court indicated that a building code was not unconstitutional. The code in question provided specific parameters within which defendants were permitted to operate. Further, the regulation, designed to protect the public from fire, was a valid exercise of the police power. The city was found to have ample authority to abate a business that was detrimental to the health or welfare of the citizens.

Public Liability for Decisions that Lead to Harm. As stated above, research has shown that local governments are far more likely to be successfully sued for conducting or permitting activities that can be shown to cause harm when damage from foreseeable natural events such as floods takes place. Governments are less likely to be sued for adopting and enforcing fair regulations that prevent harm. See:

- "Mitigating Misery: Land Use and Protection of Property Rights Before the Next Big Flood." Authors: Edward A. Thomas Esq. and Sam Riley Medlock JD. Vermont Journal of Environmental Law, Vol. 9, 2008. Law Review Article on the National Flood Insurance Program and the concept of No Adverse Impact Floodplain Management. http://www.floods.org/PDF/Mitigation/ASFPM_Thomas&Medlock_FINAL.pdf
- "No Adverse Impact and The Courts: Protecting the Property Rights of All." Authors: Dr. Jon Kusler Esq. and Edward A. Thomas Esq., Edition of November 2007. http://www.floods.org/PDF/ASFPM_NAI_Legal_Paper_1107.pdf
- "A Comparative Look at Public Liability for Hazard Mitigation," Jon Kusler, JD, PhD, ASFPM Foundation, 2009. http://www.floods.org/PDF/Mitigation/ASFPM_Comparative_look_at_pub_liability_for_flood_haz_mitigation_09.pdf
- "Liability of Design Professionals for Damages Caused in Disasters Professional Liability for Construction in Flood Hazard Areas," Kusler, L. ASFPM 2007. http://www.floods.org/PDF/ASFPM_Professional_Liability_Construction.pdf

Wetland Floodplain Interface. An article for the Louisiana State University, Sea Grant Law and Policy Program, discusses why we should develop a unified program to treat water as a precious resource. "A Perfect Storm of Opportunities to Establish and Fund a Program to Reduce Misery and Protect Water Resources," Edward A. Thomas Esq., in Louisiana Coastal Law, Vol. 89, April 2008. http://www.lsu.edu/sglegal/pdfs/lcl_89.pdf

Funding Hazard Mitigation. See a broad discussion of funding options in "Planning and Building Livable, Safe & Sustainable Communities: The Patchwork Quilt Approach." Authors: Edward A Thomas, Alessandra Jerolleman, Terri L Turner, Darrin Punchard, and Sarah Bowen, Natural Hazard Mitigation Association (NHMA), 2011. http://stormsmart.org/uploads/patchwork-quilt/patchwork_quilt.pdf

StormSmart Coasts. For a layperson's explanation of many complex legal topics, see the StormSmart Coasts website [http://stormsmartcoasts.org/]. The following items were found to be especially useful:

- StormSmart Coasts Fact Sheet 1, Introduction to No Adverse Impact (NAI) Land Management in the Coastal Zone. http://www.mass.gov/czm/stormsmart/resources/stormsmart_nai.pdf
- StormSmart Coasts Fact Sheet 2, No Adverse Impact and the Legal Framework of Coastal Management. http://www.mass.gov/czm/stormsmart/resources/stormsmart_legal.pdf
- StormSmart Coasts Fact Sheet 3, A Cape Cod Community Prevents New Residences in Floodplains. http://www.mass.gov/czm/stormsmart/resources/stormsmart_chatham.pdf

Conclusion

The issues before coastal Louisiana communities may be summarized by the quote below: "The choice of development or no development is a false choice! The choice we have as a society is rather between well planned development that protects people and property, our environment, and our precious water resources while reducing the potential for litigation; or current practices that are known to harm people, property, and natural floodplain functions … and may lead to litigation and other challenges." [Testimony of land use expert witness, Attorney Edward A. Thomas, before the State of Colorado Water Conservation Board, November 10, 2010.]

Appendix D

National Sources of Funding and Technical Assistance

Federal Programs

National Non-Profit and Private Sector Programs

RESTORE THE MISSISSIPPI RIVER DELTA

NATIONAL WILDLIFE FEDERATION

This appendix lists national sources of funding and technical assistance for implementing nonstructural measures in coastal Louisiana. This list should be referenced in conjunction with Appendix E, which provides a list of Louisiana-based resources. No one program, on its own, is sufficient to meet the needs of an entire community. Instead, coastal residents and their representatives in local governments must consider a variety of programs, assistance, and models. The organizations listed in the following two appendices offer starting points for developing this kind of multi-faceted approach.

Federal Programs

Federal Emergency Management Agency (FEMA) Grant Programs

FEMA Flood Mitigation Assistance (FMA)

Funding Source (where Louisiana citizens access it): Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP)

Actual Source: (FEMA/EPA) FEMA

Availability of funds (post-disaster/dependent on congressional appropriation): Funding is available annually; grant cycle begins in June.

Eligible entities: State agencies, tribal governments and local governments can receive funds. Individuals apply through their state agencies, local or tribal governments. Tribal governments can apply for funding directly through FEMA or through GOHSEP. Local governments and state agencies can apply through GOHSEP and can apply on behalf of individuals and non-profit organizations.

Eligible uses: To reduce or eliminate risk of flood damage to buildings insured under the National Flood Insurance Program (NFIP) before a disaster occurs. A priority of the program is reducing the number of repetitive losses to structures insured under the National Flood Insurance Program. There are three types of grants covered under FMA: planning, project, and technical assistance.

Limitations: Annually, FEMA makes $20 million available nationally. There are limits on the frequency and amount of funding to states and communities in any five-year period.

Other notes: Grant is 75% federal and 25% non-federal cost share. Cash and in-kind contributions are accepted for non-federal cost share.

Contact: Marion Pearson • marion.pearson@la.gov (225) 267-2522

Websites: www.gohsep.la.gov/mitigation/mitigationindex.htm • www.fema.gov/government/grant/fma/index.shtm

FEMA Hazard Mitigation Grant Program (HMGP)

Funding Source (where Louisiana citizens access it): Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP)

Actual Source: (FEMA/EPA) FEMA

Availability of funds (post-disaster/dependent on congressional appropriation): After a presidentially-declared disaster.

Eligible entities: State agencies, tribal governments, local governments and certain non-profit agencies can receive funds. Individuals can apply through their state agencies, local or tribal governments or non-profit groups.

Eligible uses: To address state, tribal and local mitigation priorities during recovery; mitigation planning and implementation of mitigation projects.

Other notes: Grant is 75% federal and 25% non-federal cost share. Cash and in-kind contributions are accepted for non-federal cost share.

Contact: Tonia Bergeron • tonia.bergeron@la.gov (225) 267-2749

Websites: www.gohsep.la.gov/mitigation/mitigationindex.htm • www.fema.gov/government/grant/hmgp/index

FEMA National Flood Insurance Program (NFIP)

Funding Source (where people access it): federal flood insurance coverage

Actual Source: (FEMA/EPA)

Availability of funds (post-disaster/dependent on congressional appropriation): Annually.

Eligible entities: Homeowners, business owners, governments and renters can purchase flood insurance coverage for financial protection of buildings and contents damaged by floods, mudslides or flood-related erosion.

Eligible Uses: Covers physical damage to building or personal property "directly" caused by a flood.

Limitations: Individuals must have purchased flood insurance and are only covered up to the level they have purchased.

Other notes: Most NFIP policies include Increased Cost of Compliance (ICC) coverage. This coverage can provide up to $30,000 of the cost to elevate, demolish, or relocate a home. If a community declares a resident's home substantially damaged or repetitively damaged by floods, the resident must bring his or her home up to current community standards. The total amount of the building claim and ICC cannot exceed the maximum limit for Building Property Coverage.

Contact: A local insurance agent can be of assistance.

Websites: http://www.floodsmart.gov/floodsmart/pages/index.jsp • http://www.fema.gov/business/nfip/

FEMA Community Rating System

Funding Source: FEMA

Actual Source: FEMA

Availability of funds (post-disaster/dependent on congressional appropriation): This is an incentive program.

Eligible entities: Communities that participate in the NFIP

Eligible uses: The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements.

As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS:

- Reduce flood losses;
- Facilitate accurate insurance rating; and
- Promote the awareness of flood insurance.

Limitations: N/A

Other notes: N/A

Contact: See website.

Website: http://www.fema.gov/business/nfip/crs.shtm

FEMA Pre-Disaster Mitigation Grant (PDM)

Funding Source (where Louisiana citizens access it): Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP)

Actual Source: (FEMA/EPA) FEMA

Availability of funds (post-disaster/dependent on congressional appropriation): Funds are allocated annually by Congress, and funding is available annually; Grant cycle begins in June.

Eligible entities: State agencies, tribal governments, and local governments can receive funds. Individuals apply through their state agencies, local, or tribal governments. Tribal governments can apply for funding directly through FEMA or through GOHSEP. Local governments and state agencies can apply through GOHSEP and can apply on behalf of individuals and non-profit organizations.

Eligible uses: Mitigation planning and implementation of mitigation projects.

Limitations: There must be a local mitigation plan in place before funds can be allocated.

Other notes: Grant is 75% federal and 25% non-federal cost share. Cash and in-kind contributions are accepted for non-federal cost share

Contact: Marion Pearson • marion.pearson@la.gov (225) 267-2522

Website: www.gohsep.la.gov/mitigation/mitigationindex.htm • www.fema.gov/government/grant/pdm/index

FEMA Repetitive Flood Claims (RFC)

Funding Source (where Louisiana citizens access it): Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP)

Actual Source: (FEMA/EPA) FEMA

Availability of funds (post-disaster/dependent on congressional appropriation): Funding is available annually; Grant cycle begins in June.

Eligible entities: State agencies, tribal governments and local governments can receive funds. Individuals apply through their state agencies, local or tribal governments. Tribal governments can apply for funding directly through FEMA or through GOHSEP. Local governments and state agencies can apply through GOHSEP and can apply on behalf of individuals and non-profit organizations.

Eligible uses: Available to retrofit individual properties insured under the National Flood Insurance Program (NFIP) that have had one or more claim payments for flood damage. Also supports local mitigation activities in highest risk areas.

Other notes: RFC provides up to 100% federal cost share. The grants are awarded on a nationally competitive basis.

Contact: Marion Pearson • marion.pearson@la.gov (225) 267-2522

Websites: www.gohsep.la.gov/mitigation/mitigationindex.htm • www.fema.gov/government/grant/rfc/index

FEMA Severe Repetitive Loss (SRL)

Funding Source (where Louisiana citizens access it): Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP)

Actual Source: (FEMA/EPA) FEMA

Availability of funds (post-disaster/dependent on congressional appropriation): Available on an annual basis. Funding is open-ended. Louisiana receives $16 million per year.

Eligible entities: State agencies, tribal governments and local governments can receive funds. Individuals can apply through their state agencies, local or tribal government. Tribal governments can apply for funding directly through FEMA or through GOHSEP. Local governments and state agencies can apply through GOHSEP and can apply on behalf of individuals and non-profit organizations.

Eligible uses: Can be applied to residential structures insured under the National Flood Insurance Program (NFIP) that are qualified as severe repetitive loss structures. Eligible properties must have four NFIP claim payments over $5,000 each and a cumulative amount that exceeds $20,000 or two separate claims whose total exceeds the market value of the building.

Limitations: Eligible property owners must be consulted before an application can be made.

Contact: Marion Pearson • marion.pearson@la.gov (225) 267-2522

Websites: www.gohsep.la.gov/mitigation/mitigationindex.htm • www.fema.gov/government/grant/srl/index

FEMA Mitigation Best Practices Portfolio

Funding Source (where people access it): FEMA

Actual Source: (FEMA/EPA) FEMA

Availability of funds (post-disaster/dependent on congressional appropriation): N/A

Eligible entities: Anyone can access this resource.

Eligible uses: The Mitigation Best Practices Portfolio includes best practices and case studies from around the country, including examples that do not utilize FEMA funding.

Other notes: N/A

Contact: See website.

Website: http://www.fema.gov/plan/prevent/bestpractices/index.shtm

FEMA Building Science

Funding Source (where people access it): FEMA

Actual Source: (FEMA/EPA) FEMA

Availability of funds (post-disaster/dependent on congressional appropriation): N/A

Eligible entities: Anyone can access this resource. The Building Science branch develops mitigation guidance that focuses on creating disaster-resilient communities.

Eligible uses: FEMA's Building Science Branch is a technical services bureau made up of highly skilled subject matter experts. The branch develops and produces technical guidance and tools focused on fostering a disaster resilient built environment. Located within the FEMA Federal Insurance and Mitigation Administration's (FIMA's) Risk Reduction Division, the Building Science Branch supports the directorate's mission to reduce risk to life and property by providing state of the art technical hazard mitigation solutions for buildings.

Other notes: N/A

Contact: Visit the website.

Website: http://www.fema.gov/rebuild/buildingscience/index.shtm

FEMA Special Historic Preservation Initiative - Historic Preservation and Cultural Resources Program

Funding Source (where people access it): FEMA

Actual Source: (FEMA/EPA) FEMA

Availability of funds (post-disaster/dependent on congressional appropriation): N/A

Eligible entities: Anyone can access this resource. FEMA's Historic Preservation and Cultural Resources Program integrates historic preservation considerations into FEMA's mission of preparedness, response, recovery and mitigation. During disaster recovery operations, the agency assesses damages to historic and cultural resources, provides technical assistance to state and local jurisdictions and ensures compliance with applicable federal laws and regulations, such as the National Historic Preservation Act.

Eligible uses: FEMA works with state and local governments to provide historic preservation expertise to local teams that assess the structural integrity of buildings damaged in disaster events. FEMA provides technical assistance to state and local governments on historic preservation issues and collaborates with Native American tribes to address any unique cultural concerns they may have. Historic preservation specialists also evaluate the eligibility of buildings and neighborhoods for the National Register of Historic Places.

Other notes: N/A

Contact: Visit the website.

Websites: For more information about funding assistance, see FEMA 533: Before and After Disasters: Federal Funding for cultural institutions: http://www.heritagepreservation.org/PDFS/Disaster.pdf • Find additional resources provided by the National Trust for Historic Preservation: http://www.nthp.org or http://www.preservationnation.org/

US Department of Agriculture (USDA) Programs

USDA/ Farm Service Agency (FSA) Conservation Reserve Program

Funding Source (where people access it): local parish FSA office

Actual Source: (FEMA/EPA) USDA

Availability of funds (post-disaster/dependent on congressional appropriation): Funds are available continuously for certain activities and on an annual basis for others. The sign-up period for 2011 was March 15 to April 15. See the website for specific information for upcoming years.

Eligible entities: Available to individual farmers who agree to set aside and enroll environmentally sensitive land into the program for a 10 to 15 year period

Eligible uses: Voluntary program that offers farmers annual rental payments, incentive payments for certain conservation activities and cost-share assistance to establish approved vegetation on eligible cropland. Priority activities available for continuous sign-up include filter strips, riparian buffers, grass waterways, shelter breaks, field windbreaks, wetlands restoration and high-value wildlife habitat.

Other Notes: N/A

Contact: See the website.

Website: http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=crp

USDA/ Farm Service Agency (FSA) Emergency Conservation Program

Funding Source (where people access it): local parish FSA office

Actual Source: (FEMA/EPA) USDA

Availability of funds (post-disaster/dependent on congressional appropriation): Funds are appropriated annually by Congress.

Eligible entities: Available to individual farmers affected by natural disasters

Eligible uses: Cost-share payments to rehabilitate farmlands damaged by natural disasters. Payments are available to individual farmers to perform emergency conservation and rehabilitation measures. Privately owned forest land is also covered under the Emergency Forest Restoration Program (EFRP).

Limitations: FSA cost share is up to 75%; the remainder is paid by the farmer.

Other Notes: N/A

Contact: See the website.

Website: http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=ecp

USDA Natural Resources Conservation Services (NRCS) Emergency Watershed Protection Grants Program

Funding Source (where people access it): NRCS and Project Sponsors (Emergency Watershed Protection Projects are most common)

Actual Source: USDA NRCS

Availability of funds: Not dependent on the declaration of a national emergency

Eligible Entities: Public agencies including state, city, county municipalities, towns, soil and water conservation districts or any other organization with authority to acquire land rights and operate and maintain measures installed.

Eligible uses: Financial and technical assistance is available to safeguard lives and property and eliminate or reduce hazards created by natural disasters that suddenly impair a watershed.

Other notes: USDA provides up to 75% cost-share.

Contact: See the website.

Website: http://www.nrcs.usda.gov/wps/portal/nrcs/

USDA/Rural Housing Services (RHS) Section 504 Repair Loans and Grants

Funding Source (where people access it): Local USDA Rural Development Office

Actual Source: USDA

Availability of funds: On a rolling basis

Eligible Entities: Very low-income owners of single-family homes in rural areas

Eligible uses: Funds are available for repairs to improve or modernize a home, to make a home safer or more sanitary or remove health and safety risks.

Limitations: Funds cannot be used to construct a new dwelling, to do minimal repairs that leave major hazards in the home, or move a mobile home from one site to another. Loans provide up to $20,000, and grants are available if it is determined at the time of application that the applicant will not be able to repay a loan.

Other Notes: N/A

Contact: Louisiana USDA Rural Development Office

Website: http://www.rurdev.usda.gov/HAD-RR_Loans_Grants.html

USDA Water and Waste Disposal Loan and Grant Programs

Funding Source (where people access it): State, local or area USDA Rural Development Office

Actual Source: USDA

Availability of funds: The national office will allocate funds on a project by project basis as requests are received. If the amount of funds requested exceeds the amount of funds available, the total project score will be used to select projects for funding.

Eligible entities: Local governments, Indian tribes, other public entities, and non-profit organizations, including cooperatives

Eligible uses: Loans and grants are available to develop, replace, or repair water and waste disposal (including storm drainage) systems in rural areas or towns with populations of 10,000 or fewer.

Limitations: Funds cannot be used to pay interest loans, operation or maintenance costs, or to require or refinance an existing system. Funding up to 75% of eligible project costs.

Other Notes: N/A

Contact: See the website.

Website: http://www.usda.gov/rus/water/program.htm • http://www.usda.gov/rus/water/regs/1777.pdf

US Department of Housing and Urban Development (HUD) Grant and Loan Programs

HUD Community Development Block Grant (CDBG) Program

Funding Source (where people access it): Louisiana Office of Community Development

Actual Source: HUD

Availability of funds: Post-disaster

Eligible entities: Principal cities of Metropolitan Statistical Areas (MSAs); other cities with population over 50,000; qualified urban counties of over 200,000.

Eligible uses: Grant funds are used to develop decent housing, a suitable living environment and expanded economic opportunities, principally for persons of low- to moderate-income. In a disaster, CDBG grantees may reprogram their funds to assist homeowners who: (1) are declined loans by the SBA loans program because they cannot carry any more debt and lack the ability to repay, or (2) need additional financing beyond SBA's loan limits to repair, rehabilitate, reconstruct, or replace their residencies.

Limitations: Acquisition, construction or reconstruction of buildings for the general conduct of government; political activities; certain income payments; and construction of new housing by units of general local government.

Other notes: Grantee must develop and submit its Consolidated Plan.

Contact: HUD/FHA contact 1-800-CALL-FHA (1-800-225-5342) • HUD New Orleans office (504) 671-3000 • HUD Shreveport office (318) 226-7030 • Carol Newton, Director of Louisiana CDBG Program (225) 342–7412; carol.newton@la.gov

Websites: http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs • http://www.doa.louisiana.gov/cdbg/cdbg.htm

HUD/Federal Housing Administration (FHA) Rehabilitation Mortgage Insurance Program

Funding Source (where people access it): HUD

Actual Source: HUD

Availability of funds: Year round

Eligible entities: Homebuyers and homeowners.

Eligible uses: Enables homebuyers and homeowners to finance repairs or rehabilitation through participating lenders at prevailing interest rates. Covers structural alterations and reconstruction, elimination of health and safety hazards, replacing or adding roofing, improving energy efficiency and other activities.

Limitations: The rehabilitation cost must be more than $5,000.

Other Notes: N/A

Contact: HUD/FHA contact 1-800-CALL-FHA (1-800-225-5342) • HUD New Orleans office (504) 671-3000 • HUD Shreveport office (318) 226-7030

HUD/Federal Housing Authority (FHA) Section 203 (h) Mortgage Insurance for Disaster Victims

Funding Source (where people access it): HUD

Actual Source: HUD

Availability of funds: After a federally-declared disaster

Eligible entities: Homeowners and homebuyers in a federally-declared disaster area

Eligible uses: Provide mortgage insurance to protect lenders against risk of default on loans to qualified disaster victims whose homes were destroyed or require reconstruction or replacement. Insured loans may be used to finance the purchase or reconstruction of a one-family home that will be the principal residence of the homeowner. Disaster victims are not required to meet the 3% minimum investment requirement.

Limitations: Can only be used by homeowners who will reside in the home

Other Notes: N/A

Contact: (800) 569-4287

Website: http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/sfh/ins/203h-dft

HUD/Federal Housing Administration Title I Home Repair Loan Program

Funding Source (where people access it): Local Title I lenders in Louisiana. Find a Title I lender at: http://www.hud.gov/ll/code/llslcrit.cfm

Actual Source: HUD

Availability of Funds: Year round

Eligible entities: Homeowners may apply for these loans.

Eligible uses: Loans on single-family homes may be used for alterations, repairs and site improvements. Loans for multifamily homes can be used for repairs and building alteration only. They can be used in conjunction with a Section 203k Rehabilitation Insurance Mortgage (listed above). Loans up to $25,000 are available for single-family house with a loan term of twenty (20) years.

Limitations: This program is only available for homeowners.

Other notes: N/A

Contact: (800) 767-7368 request item number 2651 "fixing up your home and how to finance it"

Website: http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/sfh/title/ti_abou

HUD Neighborhood Stabilization Program 2 Grants (NSP2)

Funding Source (where people access it): New Orleans Redevelopment Authority NSP2 Consortium

Actual Source: HUD

Availability of Funds: See website.

Eligible entities: See website.

Eligible uses: The Neighborhood Stabilization Program (NSP) began in 2008 to help communities deal with problems resulting from the national foreclosure crisis. Funds are used to purchase, repair and resell foreclosed and abandoned homes to qualified buyers.

Limitations: These funds are only available for foreclosed and abandoned homes.

Other notes: N/A

Contact: See website.

Websites: http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning communitydevelopment/programs/neighborhoodspg/arrafactsheet • http://www.noraworks.org/nsp2/consortium-members

US Army Corps of Engineers Programs

US Army Corps of Engineers (USACE) Compensatory Mitigation Funding through Section 404 of the Clean Water Act

Funding Source (where people access it): EPA and other agencies

Actual Source: EPA and other agencies

Availability of Funds: See website

Eligible entities: See website

Eligible uses: Compensatory Mitigation Funding aims to reduce adverse effects to wetlands, streams and other aquatic resources through compensatory mitigation. Compensatory mitigation refers to the restoration, establishment, enhancement, or in certain circumstances, preservation of wetlands, streams or other aquatic resources for the purpose of offsetting unavoidable adverse impacts. Even after avoiding and minimizing impacts, projects that will cause adverse impacts to wetlands, streams and other aquatic resources typically require some type of compensatory mitigation. The Army Corps of Engineers (or approved state authority) is responsible for determining the appropriate form and amount of compensatory mitigation required. Methods of compensatory mitigation include restoration, establishment, enhancement and preservation.

Limitations: See website.

Other notes: Permittee-Responsible Mitigation: Restoration, establishment, enhancement or preservation of wetlands undertaken by a permittee in order to compensate for wetland impacts resulting from a specific project. The permittee performs the mitigation after the permit is issued and is ultimately responsible for implementation and success of the mitigation. Permittee-responsible mitigation may occur at the site of the permitted impacts or at an off-site location within the same watershed.

Mitigation Banking: A wetlands mitigation bank is a wetland area that has been restored, established, enhanced or preserved, which is then set aside to compensate for future conversions of wetlands for development activities. Permittees, upon approval of regulatory agencies, can purchase credits from a mitigation bank to meet their requirements for compensatory mitigation. The value of these "credits" is determined by quantifying the wetland functions or acres restored or created. The bank sponsor is ultimately responsible for the success of the project. Mitigation banking is performed "off-site," meaning it is at a location not on or immediately adjacent to the site of impacts, but within the same watershed. Federal regulations establish a flexible preference for using credits from a mitigation bank over the other compensation mechanisms.

In-Lieu Fee Mitigation: Mitigation that occurs when a permittee provides funds to an in-lieu-fee sponsor (a public agency or non-profit organization). Usually, the sponsor collects funds from multiple permittees in order to pool the financial resources necessary to build and maintain the mitigation site. The in-lieu fee sponsor is responsible for the success of the mitigation. Like banking, in-lieu fee mitigation is also "off-site," but unlike mitigation banking, it typically occurs after the permitted impacts.

Contact: See website.

Website: http://water.epa.gov/lawsregs/guidance/wetlands/wetlandsmitigation_index.cfm

US Army Corps of Engineers (USACE) Silver Jackets Program

Funding Source (where people access it): USACE and other agencies

Actual Source: Local USACE office and other agency budgets

Availability of Funds: See website.

Eligible entities: See website.

Eligible uses: The US Army Corps of Engineers (USACE) has initiated the Silver Jackets Program in order to create a way to apply a more collective and long term approach to link together lessons learned from a major disaster, and then apply them to comprehensive solutions. With this program, USACE, the Federal Emergency Management Agency (FEMA), and other federal agencies create an interagency team at the state level to develop and implement solutions to state natural hazard priorities. The program's primary goals are to leverage information and resources, improve public risk communication through a united effort, and create a continuous mechanism to collaboratively solve issues and implement initiatives.

Limitations: These teams are not currently active in every state.

Other notes: Active Silver Jackets teams now serve 28 states, the USACe plans to expand the program to every state. However, the intent is not to duplicate or take over similar state efforts that may already exist. This program will support existing efforts, strengthen partnerships that need improvement, and help establish relationships where they do not exist. Current teams have succeeded not only in improving communication, but also in leveraging resources and programs between agencies. These teams also serve as an interagency technical resource to the state and local communities to develop strategies for long-term sustainability.

Contact: See website.

Website: www.iwr.usace.army.mil/nfrmp/state/

US Army Corps of Engineers (USACE) Flood Plain Management Services (FPMS) Program

Funding Source (where people access it): USACE

Actual Source: Local USACE office

Availability of Funds: See website.

Eligible Entity: State, regional and local governments, Indian Tribes, and other non-federal public agencies Also available to non-water resource federal agencies and to the private sector on a 100% cost recovery basis.

Eligible uses: The FPMS Program provides the full range of technical services and planning guidance needed to support effective flood plain management, including the following areas:

- General Technical Services - The program develops or interprets site-specific data on obstructions to flood flows, flood formation and timing; flood depths or stages; flood-water velocities; and the extent, duration, and frequency of flooding. It also provides information on natural and cultural flood plain resources of note, as well as flood loss potentials before and after the use of flood plain management measures.
- General Planning Guidance - On a larger scale, the program provides assistance and guidance in the form of "Special Studies" on all aspects of floodplain management planning including the possible impacts of off-flood plain land use changes on the physical, socio-economic, and environmental conditions of the flood plain. This guidance can range from helping a community identify present or future flood plain areas and related problems, to a broad assessment of which remedial measures may be effectively used. Some of the most common types of Special Studies include:
  - Flood Plain Delineation/Flood Hazard Evaluation Studies
  - Dam Break Analysis Studies
  - Hurricane Evacuation Studies
  - Flood Warning/Preparedness Studies
  - Regulatory Floodway Studies
  - Comprehensive Flood Plain Management Studies
  - Flood Damage Reduction Studies
  - Urbanization Impact Studies
  - Storm water Management Studies
  - Flood Proofing Studies
  - Inventory of Flood Prone Structures
- The program also provides guidance and assistance for meeting standards of the National Flood Insurance Program and for conducting workshops and seminars on non-structural flood plain management measures, such as flood proofing.

- Guides, Pamphlets and Supporting Studies - The program enables studies to be conducted to improve methods and procedures for mitigating flood damages. Also, for preparing guides and pamphlets on flood proofing techniques, flood plain regulations, flood plain occupancy, natural flood plain resources, and other related aspects of flood plain management.

Limitations: See website.

Other notes: The objective of the Flood Plain Management Services (FPMS) Program is to foster public understanding for dealing with flood hazards and to promote prudent use and management of the nation's floodplains. Federal allotments for each state or tribe from the nationwide appropriation are limited to $500,000 annually. Historically, individual studies, of which there may be more than one per state or tribe per year, cost $25,000 to $75,000.

The Corps also provides updates on efforts to improve flood risk reduction in the New Orleans area: www.nolaenvironmental.gov.

US Army Corps of Engineers (USACE) Planning Assistance to States (PAS) Program

Funding Source(where people access it): USACE and local match

Actual Source: USACE and local match

Availability of Funds: See website.

Eligible entities: States, local governments and non-federal agencies

Eligible uses: Under the Planning Assistance to State (PAS) Program, the USACE can provide assistance to states, local governments and other non-federal entities in the preparation of a wide variety of comprehensive studies to address water resources issues. These studies can include flood damage reduction studies or other related studies. Studies under this program are cost shared on a 50% federal and 50% non-federal basis.

Limitations: The required match can be a deterrent to communities.

Other notes: The Corps also provides updates on efforts to improve flood risk reduction in the New Orleans area: www.nolaenvironmental.gov.

Contact: See website.

Website: http://www.experts123.com/q/what-is-the-usace-planning-assistance-to-states-pas-program.html

National Science Foundation Mitigation Research Grants

Website: http://www.nsf.gov/funding/index.jsp

US Army Corps of Engineers (USACE) Compensatory Mitigation Funding through Section 404 of the Clean Water Act

Funding Source (where people access it): NSF

Actual Source: NSF

Availability of Funds: Funds are made available yearly.

Eligible entities: Individual researchers and public and private research institutions.

Eligible uses: The HMSE program supports fundamental research on the design and performance of structural systems and on new technologies for improving the behavior, safety, and reliability of structural systems and their resistance to natural hazards such as earthquakes and technological hazards, such as bombs. Also supported by the program are innovations in analysis and model-based simulation of structural behavior and response, design concepts that improve structural performance, reliability, resilience and sustainability, structural health monitoring, and applications of new control techniques for structural systems.

Limitations: N/A

Other Notes: N/A

Contact: See website.

Website: http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13358&org=NSF&more=Y#more

National Science Foundation (NSF) Resilient and Sustainable Infrastructures Program

Funding Source (where people access it): NSF

Actual Source: NSF

Availability of Funds: Funds are made available yearly.

Eligible entities: Individual researchers and public and private research institutions.

Eligible uses: The Resilient and Sustainable Infrastructures Cluster supports research to advance fundamental knowledge and innovation for resilient and sustainable civil infrastructure and distributed infrastructure networks. The cluster funds research on geotechnical, structural, and earthquake engineering, distributed infrastructure systems management and response to hazardous events. Research on social, becavioral, and economic issues related to natural and technological hazards is also invited. The Cluster plays a major role in the National Earthquake Hazards Reduction Program (NEHRP), created by Congress by the Earthquake Hazards Reduction Act of 1977.

Limitations: N/A

Other Notes: N/A

Contact: See website.

Website: http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13545&org=NSF&more=Y#more

National Science Foundation (NSF) Infrastructure Management and Extreme Events (IMEE)

Funding Source (where people access it): NSF

Actual Source: NSF

Availability of Funds: Funds are made available yearly.

Eligible entities: Individual researchers and public and private research institutions.

Eligible uses: The IMEE program focuses on the impact of large-scale hazards on civil infrastructure and society and on related issues of preparedness, response, mitigation, and recovery. The program supports research to integrate multiple issues from engineering, social, behavioral, political, and economic sciences. It supports fundamental research on the interdependence of civil infrastructure and society, development of sustainable infrastructures and civil infrastructure vulnerability and risk reduction.

Limitations: N/A

Other Notes: N/A

Contact: See website.

Website: http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13353

US Department of Commerce Programs

US Department of Commerce, Gulf Coast Ecosystem Restoration Council

Funding Source (where people access it): Congress

Actual Source: Administrative and civil fines from Deepwater Horizon oil spill

Availability of funds: N/A

Eligible entities: N/A

Eligible uses: According to their website, "The RESTORE Act established a Gulf Coast Ecosystem Restoration Council (the Council), which is comprised of governors from the five affected Gulf States', the Secretaries from the U.S. Departments of the Interior, Commerce, Agriculture, and Homeland Security as well as the Secretary of the Army and the Administrator of the U.S. Environmental Protection Agency. The Gulf States recommended and President Obama appointed the Secretary of Commerce as the Council's Chair.

The RESTORE Act dedicates 80 percent of all administrative and civil penalties related to the Deepwater Horizon spill to a Gulf Coast Restoration Trust Fund and outlines a structure by which the funds can be utilized to restore and protect the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, coastal wetlands, and economy of the Gulf Coast region. The RESTORE Act sets forth the following framework for allocation of the Trust Fund:

- 35 percent equally divided among the five States for ecological restoration, economic development, and tourism promotion;
- 30 percent plus interest managed by the Council for ecosystem restoration under the Comprehensive Plan;
- 30 percent divided among the States according to a formula to implement State expenditure plans, which require approval of the Council;
- 2.5 percent plus interest for the Gulf Coast Ecosystem Restoration Science, Observation, Monitoring and Technology Program within the Department of Commerce's National Oceanic and Atmospheric Administration (NOAA); and

- 2.5 percent plus interest allocated to the States for Centers of Excellence Research grants, which will each focus on science, technology, and monitoring related to Gulf restoration."

Limitations: see above.

Other notes: The council released its first document, The Path Forward to Restoring the Gulf Coast in January 2013.

Contact: Olivia Watkins State of Louisiana, Olivia.Watkins@LA.GOV • (225) 241-5707

Websites: http://www.restorethegulf.gov/

US Department of Commerce/Economic Development Administration Technical Assistance Grants

Funding Source (where people access it): DOC/EDA

Actual Source: DOC/EDA

Availability of funds (post-disaster/dependent on congressional appropriation): After a federally declared disaster

Eligible entities: State and local governments

Eligible uses: Grants to state and local governments for strategic recovery planning and implementation. Recovery plans focus on job retention/creation to help offset the economic impacts of disasters. Grants may provide technical assistance to address industry-specific economic dislocations, e.g., marketing/promotional activities to revive the tourism industry, economic development feasibility studies, or professional expertise to assist local communities in recovery efforts.

Limitations: N/A

Other notes: N/A

Contact: See website

Website: http://la.stormsmart.org/funding/doceda-technical-assistance-grants/

US Department of Commerce/Economic Development Administration Revolving Loan Fund (RLF)

Funding Source (where people access it): DOC/EDA

Actual Source: DOC/EDA

Availability of funds (post-disaster/dependent on congressional appropriation): After a federally declared disaster

Eligible entities: See website

Eligible uses: Funding for local short-term "gap" financing for business recovery in affected communities. Grantees may provide assistance to businesses that: 1) are declined loans by SBA; or 2) need additional financing beyond SBA's loan limits. Local RLF lenders have the flexibility to provide financing to: 1) supplement traditional lending; 2) setup a local micro-lending program; or 3) develop a local public/private infrastructure lending program to implement local business recovery initiatives.

Limitations: N/A

Other notes: N/A

Contact: See website

Website: http://la.stormsmart.org/funding/doceda-revolving-loan-fund/

US Department of Commerce/Economic Development Administration Planning Grants

Funding Source (where people access it): DOC/EDA

Actual Source: DOC/EDA

Availability of funds (post-disaster/dependent on congressional appropriation): After a federally declared disaster

Eligible entities: States and local governments

Eligible uses: Grants to states and local governments to fund Economic Development Coordinators who: 1) assess economic injury and facilitate a locally developed, long-term economic recovery planning process for the impacted area; 2) provide a local on-site resource for effective economic development program coordination; and 3) carry out project implementation activities consistent with the long-term economic recovery plan.

Limitations: N/A

Other notes: N/A

Contact: See website

Website: http://la.stormsmart.org/funding/doceda-planning-grants/

US Department of Commerce/National Oceanic and Atmospheric Administration StormReady Program and Deepwater Horizon Materials

Funding Source (where people access it): NOAA and local program

Actual Source: NOAA and local program

Availability of funds: See website.

Eligible entities: See websites.

Eligible uses: NOAA StormReady Program gives communities education and tools necessary to survive severe weather both before and during the event.

Limitations: See website

Other notes: In its role as a trustee in the Natural Resource Damage Assessment after the Deepwater Horizon oil spill, NOAA has materials available at the website below.

Contact: Contact the local program.

Website: www.stormready.noaa.gov • http://www.gulfspillrestoration.noaa.gov

US Department of Commerce/National Oceanic and Atmospheric Administration Sea Grant Research Funding Opportunities

Funding Source (where people access it): NOAA and local program

Actual Source (where people access it): NOAA and local program

Availability of funds: Each program announces the availability of funding on an annual or biannual basis.

Eligible entities: Contact local program.

Eligible uses: The National Sea Grant College Program sponsors a variety of marine research, outreach and education projects, primarily through the 32 state Sea Grant programs.

Limitations: These funds are not available in every state.

Other notes: N/A

Contact: Contact the local program.

Website: http://www.seagrant.noaa.gov/funding/fundingfellowships.html

US Department of Commerce Programs

US Department of Energy (DOE) Technical Assistance Programs Weatherization Assistance Program (WAP)

Funding Source (where people access it): Louisiana Weatherization Assistance Program

Actual Source: Department of Energy Weatherization Assistance Program

Availability of funds: See website.

Eligible entities: DOE provides funds to state governments, U.S. overseas territories, and Indian tribal governments. Local governments and non-profit organizations can manage the funds, providing services to low-income families.

Eligible uses: WAP is available to low-income families to permanently reduce their energy bills by making their homes more energy efficient.

Limitations: These funds are only for low-income families.

Other notes: DOE also can provide training resources and materials.

Contact: Darleen Okammor, Manager, 225-763-8700 ext 234, dokammor@lhfa.state.la.us

Websites: http://www1.eere.energy.gov/wip/wap.html • http://www1.eere.energy.gov/wip/project_map/project_details_new.aspx?pid=75

US Environmental Protection Agency (EPA) Wetlands Program Development Grants

Funding Source (where people access it): EPA

Actual Source: EPA

Availability of funds: See website.

Eligible entities: States, tribes, local governments (S/T/LGs), interstate associations, intertribal consortia and national non-profit / non-governmental organizations are eligible to apply.

Eligible uses: The Wetland Program Development Grants (WPDGs) provide eligible applicants an opportunity to conduct projects that promote the coordination and acceleration of research, investigations, experiments, training, demonstrations, surveys and studies relating to the causes, effects, extent, prevention, reduction and elimination of water pollution. While WPDGs can continue to be used by recipients to build and refine any element of

a comprehensive wetland program, priority will be given to funding projects that address the three priority areas identified by EPA: Developing a comprehensive monitoring and assessment program; improving the effectiveness of compensatory mitigation; and refining the protection of vulnerable wetlands and aquatic resources.

Limitations: N/A

Other notes: N/A

Contact: Region 6 Office (AR, LA, NM, OK, TX) • Sondra McDonald • US EPA Region 6 • 1445 Ross Avenue, MC 6WQ-AT, Dallas, TX 75202 • Phone: 214-665-7187

Websites: http://water.epa.gov/grants_funding/wetlands/grantguidelines/index.cfm

US Small Business Administration (SBA) Disaster Loan Program

Funding Source (where people access it): SBA offices

Actual Source: (FEMA/EPA) SBA

Availability of funds (post-disaster/dependent on congressional appropriation): After a federally declared disaster

Eligible entities: Homeowners, renters, business and private non-profit organizations

Eligible uses: Low-interest disaster loans to homeowners, renters, businesses and private nonprofit organizations to repair or replace real estate, personal property, machinery and equipment, inventory and business assets that have been damaged or destroyed in a declared disaster.

Limitations: Renters and homeowners may borrow up to $40,000 to repair or replace items damaged in a disaster and homeowners may apply for a loan up to $200,000 to repair or replace primary residence to its pre-disaster condition. Loans may be increased up to 20% of total amount of disaster damage to make improvements that lessen the risk of property damage by future disasters of the same kind.

Interest rate is between 4% and 8% depending on whether homeowners can obtain credit elsewhere. Businesses and nonprofit organizations can apply for a Physical Disaster Loan up to $2 million to repair or replace damaged real estate, equipment, inventory and fixtures. The loan may be increased by as much as 20% of the total amount of disaster damage to protect the property against future disasters of the same type.

Other notes: N/A

Contact: Small Business Administration Disaster Loans • 1-800-659-2955 • disastercustomerservice@sba.gov

Website: http://www.sba.gov/about-offices-content/1/2462

Non-Profit and Private Sector Programs

National Organizations

American Red Cross/Ready Rating Program

Funding Source (where people access it): American Red Cross

Actual Source: Sponsors are listed as Anheuser Busch Companies and Sam's Club. The Red Cross also works with other agencies on response and preparedness activities.

Availability of funds (post-disaster/dependent on congressional appropriation): N/A

Eligible entities: N/A

Eligible uses: Assist individuals, families and businesses/schools prepare for potential disaster. As stated on their website, "Organizations understand the need for being prepared and ready for disasters, but often consider the process for getting better prepared as cumbersome and complicated. Since its inception in 2008, the Ready Rating Program has been recognized by preparedness experts as the much needed, easy to understand and not intimidating solution for helping an organization take the steps to become prepared to respond to and successfully withstand a disaster and other emergencies. . . . Beginning in February 2011, these enhancements will now be available to more organizations while providing an even better experience for current Ready Rating member organizations!"

Limitations: N/A

Other notes: The new on-line tool related to the Ready Rating System provides a comprehensive way for businesses, schools, organizations, families and individuals to prepare for disaster and to rate their readiness.

Contact: See website.

Website: http://readyrating.org/noflash.aspx

Insurance Institute for Business and Home Safety (IBHS) Fortified for Safer Living Standard

Funding Source (where people access it): N/A

Actual Source: N/A

Availability of funds (post-disaster/dependent on congressional appropriation): N/A

Eligible entities: N/A

Eligible uses: Every area of North America is vulnerable to some type of natural disaster. For that reason, the Institute for Business & Home Safety (IBHS) created the FORTIFIED for Safer Living® single-family residential construction program. The program offers a package of "code-plus" upgrades that greatly increase a new home's resistance to natural perils, including hurricane, tornado, wildfire, flood, freezing weather, hail and earthquake, as well as to fire and interior water damage. Specifically, fortified requirements strengthen a home's outer envelope, notably roof and wall systems, doors, glazed openings, and the foundation.

Limitations: N/A

Other notes: Currently, over 200 projects in 16 states have earned the FORTIFIED for Safer Living® designation or are in various stages of completion. Please note that the Fortified designation process must be initiated before construction begins.

Contact: Rem Brown, at 813-675-1032

Website: http://www.disastersafety.org/fortified/safer_living/fsl-fortified-professionals/fortified-for-safer-living-standards-guide/

Federal Alliance for Safe Homes (FLASH)

Funding Source (where people access it): N/A

Actual Source: N/A

Availability of funds (post-disaster/dependent on congressional appropriation): N/A

Eligible entities: N/A

Eligible uses: The Federal Alliance for Safe Homes provides many education resources related to retrofitting structures to protect from all hazards.

Limitations: N/A

Other notes: N/A

Contact: See website

Website: www.flash.org

Association of State Floodplain Managers: No Adverse Impact Strategy

Funding Source (where people access it): N/A

Actual Source: N/A

Availability of funds (post-disaster/dependent on congressional appropriation): N/A

Eligible entities: Any community

Eligible uses: Higher standards in relation to flood risk are eloquently found in the Association of State Floodplain Managers (ASFPM) No Adverse Impact (NAI). The ASFPM is a respected voice in floodplain management practice and policy in the United States and has spent the last several years coming up with a workable and cost effective solution. No Adverse Impact (NAI) is a strategy that changes the focus from building within the environment to "do no harm." No Adverse Impact (NAI) ensures that the action of any community or property owner, public or private, does not adversely impact the property and rights of others. The true strength of the NAI approach is that it encourages local decision making to ensure that future development impacts will be identified, considered on a watershed-wide basis, and mitigated. It is a truly comprehensive strategy for reducing the losses, costs and human suffering caused by flooding.

Limitations: N/A

Other notes: N/A

Contact: See website.

Website: www.floods.org

Coastal Services Center/NOAA/Association of State Floodplain Managers: Coastal No Adverse Impact Strategy

Funding Source (where people access it): N/A

Actual Source: N/A

Availability of funds (post-disaster/dependent on congressional appropriation): N/A

Eligible entities: Any coastal community.

Eligible uses: The Coastal Services Center, National Oceanic and Atmospheric Administration and the Association of State Floodplain Managers (ASFPM) sponsored the Coastal No Adverse Impact (CNAI) Handbook. The information in this publication demonstrates the application of mitigation strategies for the management of natural hazards occurring along the nation's coasts.

Limitations: N/A

Other notes: N/A

Contact: See website.

Website: http://www.floods.org/index.asp?menuid=340

Voluntary Organizations Active in Disasters (VOAD)

Funding Source (where people access it): N/A

Actual Source: N/A

Availability of funds (post-disaster/dependent on congressional appropriation): N/A

Eligible entities: N/A

Eligible uses: The VOAD framework provides the venue for agencies to coordinate, collaborate, communicate, and cooperate on disaster planning, training and response. This occurs at a national (NVOAD), state (VOAD) and community (COAD) levels. VOAD is working to include organizations that may not think of themselves as being part of a post-disaster planning process, even though they have an extremely important role to play. Local non-governmental organizations fit this profile whose focus may be childcare, the elderly, housing, or community development in non-disaster times. Outreach to these groups is critical.

Limitations: N/A

Other notes: Participating agencies include, but are not limited to: the American Red Cross, the Salvation Army, the Mennonites, Catholic Charities, Church World Service, the Latter Day Saints, and the Presbyterian Disaster Services. They are key players for supplying organizational skills, materials, funds, and voluntary labor, especially for the poor, disadvantaged and elderly disaster survivors. These organizations can help address special needs groups, such as children.

Contact: See website

Website: The Link to the National Voluntary Organizations Active in Disaster Long-Term Recovery Manual is: www.nvoad.org/library/doc.../30-long-term-recovery-guide

Community and Regional Resilience Institute (CARRI)

Funding Source (where people access it): N/A

Actual Source: N/A

Availability of funds (post-disaster/dependent on congressional appropriation): N/A

Eligible entities: N/A

Eligible uses: The goal of CARRI is to help develop and share critical paths that any community or region may take to strengthen its ability to prepare for, respond to and rapidly recover from significant man-made or natural disasters with minimal downtime to basic community, government and business services.

Limitations: N/A

Other notes: CARRI is designed to combine community engagement activities with research activities. CARRI created the Community and Regional Resilience Institute in 2009. Establishment of this new Institute was an important step in furthering CARRI's initial work in the Southeast and realizing the full potential of the expanding community practice and growing body of research.

Contact: See website.

Website: www.resilientus.org

Other Professional Associations

These associations can be sources of technical knowledge, best practices and other assistance:

1. American Bar Association (ABA): http://www.americanbar.org/aba.html

2. American Planning Association (APA): http://planning.org/
• Louisiana Chapter (APALA) http://www.louisianaplanning.com/jobs_practice/jobs/la-job-opportunities/femaregionvi-hazardmitigationdivision

3. American Society Civil Engineers (ASCE): http://www.asce.org/

4. American Society of Public Administration (ASPA): http://www.apsanet.org/content_8506.cfm

5. Association of State Floodplain Managers (ASFPM): http://www.floods.org/

6. Louisiana Emergency Preparedness Association (LEPA): http://www.lepa.org/

7. Louisiana Flood Plain Managers Association (LFMA): http://lfma.org/

8. National Emergency Management Association (NEMA): http://www.nemaweb.org/index.php?option=com_content&view=article&id=44&Itemid=357

9. Natural Hazard Mitigation Association (NHMA): http://nhma.info/

Private Foundations

Kresge's Environmental Program

Funding Source (where people access it): Kresge Foundation

Actual Source: Kresge Foundation

Availability of funds (post-disaster/dependent on congressional appropriation): See website.

Eligible entities: See website.

Eligible uses: The foundation supports organizations that use a combined natural systems-human systems approach to climate-change adaptation. The foundation is currently funding the Gulf Restoration Network for Wetland Restoration planning assistance, the Environmental Defense Fund for its "re-envisioning the Mississippi" program, and Oxfam America's Coastal Community Initiative, which supports community groups that create jobs in environmental restoration.

Limitations: N/A

Other notes: N/A

Contact: See website.

Website: http://www.cisionwire.com/the-kresge-foundation/r/nonprofits-work-with-gulf-coast-communities-to-respond-to-climate-change,c9162008

Norman Foundation

Funding Source (where people access it): Norman Foundation

Actual Source: Norman Foundation

Availability of funds (post-disaster/dependent on congressional appropriation): See website.

Eligible entities: See website.

Eligible uses: The Norman Foundation provides grants for environmental justice along with other grant types.

Limitations: N/A

Other notes: N/A

Contact: See website.

Website: www.normanfdn.org

The McKnight Environmental Program Mississippi River Grants

Funding Source (where people access it): McKnight

Actual Source: McKnight

Availability of funds (post-disaster/dependent on congressional appropriation): See website. Planning, operating and project grants

Eligible entities: Entities classified by the IRS as tax-exempt, non-profit organizations. Units of government for special projects that are traditionally not the responsibility of the government.

Eligible uses: 1.) Restore and protect floodplains and wetlands in the 10-state Mississippi River Corridor

2.) Reduce agricultural pollution in four states along the northern half of the river (MN, WI, IA, IL), focusing on farmland operations with high levels of nitrogen and phosphorous runoff

3.) Achieve cross-boundary and interagency coordination (among government agencies) that improves the river's water quality and resilience.

Limitations: If grant is for capital funding, at least half of the total project budget must be raised before applying for a grant.

Other Notes: N/A

Contact: McKnight Foundation phone: 612-333-4220

Website: http://www.mcknight.org/environment/river.aspx

Appendix E

Resources for Louisiana Communities

RESTORE THE MISSISSIPPI RIVER DELTA

NATIONAL WILDLIFE FEDERATION

LOCAL Organizations

STATE, REGIONAL, and NATIONAL Non-Governmental Organizations

STATE Agencies and Programs

RESTORE THE MISSISSIPPI RIVER DELTA

NATIONAL WILDLIFE FEDERATION

This appendix lists Louisiana based sources of assistance for carrying out nonstructural measures in coastal Louisiana. This list should be referenced in conjunction with Appendix D, which provides a list of national funding and other resources. No one program, on its own, is sufficient to meet the needs of an entire community. Instead, coastal residents and their representatives in local governments must consider a variety of programs, assistance, and models. The organizations listed in Appendices D and E offer starting points for developing this kind of multi-faceted approach.

LOCAL Organizations

Bayou Grace Community Services
(www.bayougrace.wordpress.com/)

Social Media Used:
Blog available on website. Also available on Facebook, Twitter, StumbleUpon and through e-mail subscription on the website.

Specific Proposals:
As stated on the website, Bayou Grace addresses the most critical and immediate needs of residents of the five bayous in Lower Terrebonne Parish, LA, which include:
- Bayou Point-aux-Chenes - Pointe-aux-Chenes, LA
- Bayou Terrebonne - Montegut, LA
- Bayou Petit Caillou - Chauvin, Robinson Canal and Cocodrie, LA
- Bayou Grand Caillou - Dulac, LA
- Bayou Dularge - Dularge & Theriot, LA

Bayou Grace aims to give renewed strength to these communities, mobilizing residents in support of their environmental health.

Other Partners:
- BTNEP (Barataria Terrebonne National Estuary Program)
- Episcopal Community Services
- Gulf AID Acadiana
- Gulf Coast Fund Rockefeller /Philanthropy Advisors
- Gulfsongs
- The McKnight Foundation
- Oxfam America
- Orphan Grain Train
- Ripple Effect Foundation

Comments: Partners can participate in an on-line photo project called "Why Should We Save Coastal Louisiana?"

Bayou Interfaith Shared Community Organizing (BISCO)
(www.bisco-la.org/home)

Social Media Used: http://bisco-la.org/blog/rss_comments or the webpage listed above. Also available on Facebook.

Specific Proposals: As stated on the website, BISCO's mission is to build a powerful, multi-faith, multi-ethnic, multi-racial, multi-issue organization that serves as a voice for all people in the communities of Lafourche and Terrebonne Parishes in southeastern Louisiana. "We are everyday and ordinary church people working together with our ministers to bring about positive changes in our communities."

BISCO is committed to using faith-based community organizing to empower residents to effect positive change on social justice issues such as poverty, illiteracy, and racism, and address hurricane recovery issues such as environmental health hazards, loss of housing, employment, and infrastructure. "BISCO's biggest challenge involves addressing the massive humanitarian, economic, environmental, cultural and social impacts facing our community and the world as a result of devastating man-made coastal land loss in our area."

Other Partners: Besides 18 Congregation Convent Members (local parish churches), BISCO is also represented on many local, state, and regional boards including:
- Louisiana Common Cause
- Louisiana Center for Women & Government - Leadership Council
- Louisiana Ethics I
- Region III Mental Health Advisory Council
- Lafourche Parish Children and Youth Board
- Lafourche Community Action Board
- Equity and Inclusion Campaign (LA, MS and AL)

Funders include:
- Catholic Campaign for Human Development
- Center for Social Inclusion
- Gulf Coast Fund for Community Renewal and Ecological Health
- OxFam American
- Southern Partners

Evacuteer
(www.evacuteer.org/)

Social Media Used: See Twitter account: (http://twitter.com/#!/Evacuteer) and a "Join Us" form for volunteers (http://evacuteer.org/training-registration).

Specific Proposals: As stated on the website, Evacuteer.org is a non-profit organization that recruits, trains, and manages evacuation volunteers (evacuteers) in New Orleans. The volunteers help implement the "City Assisted Evacuation Plan" (CAEP), which activates when a mandatory evacuation is called in the city of New Orleans. This plan is designed to move 25,000-30,000 New Orleanians who do not have private transportation. The city has successfully implemented the plan once, in advance of Hurricane Gustav (Sept. 2008), when 18,000 residents utilized the CAEP. Evacuteer.org was created out of lessons learned from that experience.

Through an existing agreement with the City of New Orleans Office of Homeland Security and Emergency Preparedness, Evacuteer manages all volunteers who work at 17 neighborhood pick-up points, the Union Passenger Terminal, and City Hall. The organization also develops academic, peer reviewed emergency preparedness research, and emergency preparedness campaigns, including an initiative to commission public art that doubles as hurricane evacuation pick up point markers."

Other Partners: The website lists several organizations (http://evacuteer.org/partners) that are primarily New Orleans' based volunteer and disaster response organizations, churches, civic and neighborhood/district associations.

Comments: A critical component in non-structural activities is the inclusion of emergency preparedness planning in communities, including evacuation in hurricane prone zones. This community wide initiative may serve as a model for other communities as Evacuteer's "proof of concept" moves forward.

MRGO Must Go

(www.MRGOmustGO.org)

Social Media Used: Available on Facebook, flickr, Twitter and You Tube. Newsletter sign up: http://www.mrgomustgo.org/component/option,com_ckforms/Itemid,100007/id,2/view,ckforms/

Specific Proposals: As stated on the website, the MRGO Must Go Coalition was founded in 2006. Its mission is to ensure that the wetlands affected by the MRGO are carefully restored in a timely manner. The coalition includes local and national environmental, social justice and community organizations. Since its inception, the coalition has served as a liaison between the community and the Corps. The group hosts educational forums, media tours, and rallies. They also conduct outreach through a website and social networking sites, and by attending meetings and events in the Greater New Orleans area. The Coalition also uses its vast organizational resources and expertise to make policy and scientific recommendations on the restoration of the ecosystem impacted by the MRGO.

See: "what we need to do" page: (http://www.mrgomustgo.org/mississippi-river-gulf-outlet/how-to-fix-the-mrgo/what-do-we-need-to-do.html).

Publications:
The website lists several documents that track the group's recommendations.

Other Partners:
- American Rivers
- Citizens Against Widening the Industrial Canal (CAWIC)
- Coalition to Restore Coastal Louisiana
- Environmental Defense Fund
- Global Green
- Gulf Restoration Network
- Holy Cross Neighborhood Association
- Lake Pontchartrain Basin Foundation
- Levees.org
- Louisiana Environmental Action Network
- Louisiana Wildlife Federation
- Lower Mississippi Riverkeeper
- Lower Ninth Ward Center for Sustainable Engagement and Development
- Mary Queen of Viet Nam (MQVN): Community Development Corporation
- National Audubon Society
- National Wildlife Federation
- Sierra Club - Delta Chapter

Save New Orleans Homes

(www.probono.net/la/saveneworleanshomes/)

Specific Proposals: As stated on the website, almost eight years after Hurricane Katrina, many homeowners in New Orleans have not been able to make necessary repairs and return to their homes because they do not have clear title to their land. Many of these homeowners live in family homes, which are often passed down informally and outside of the legal system. Without clear ownership, homeowners are unable to access the recovery grants and loans required to repair and eventually return to their homes. Not only individuals, but entire neighborhoods, are affected by these blighted and unoccupied homes. Through this joint project, the partner organizations coordinate their work to provide pro bono (free) legal assistance and education to aid homeowners in resolving title issues. The partners will also advocate to reform policy at the state and local levels

in an effort to remove barriers to clearing title, preserving homes, and restoring neighborhoods.

Other Partners: Save New Orleans Homes is a joint project funded by the Greater New Orleans Foundation (http://www.gnof.org/). Southeast Louisiana Legal Services (SLLS) (http://www.slls.org/), The Pro Bono Project (PBP) (http://www.probono-no.org/), Louisiana Appleseed (http://louisiana.appleseednetwork.org/), and the Lawyers' Committee for Civil Rights Under Law (http://www.lawyerscommittee.org/) are channeling their pro bono resources and expertise in heir property and title issues in order to assist homeowners. SLLS and PBP are local legal aid organizations that have helped thousands of Orleans Parish residents cure title problems for many years. Louisiana Appleseed conducts research and advocacy to support laws that enable homeowners to secure title to their homes. Through their attorney volunteers and staff, Louisiana Appleseed educates community members on issues surrounding heir property and clear title. The Lawyers' Committee provides education and legal assistance on the issue of title clearing throughout the country.

Women of the Storm
(www.womenofthestorm.net)

Social Media Used: Women of the Storm has an email list. To sign up, see: http://www.womenofthestorm.net/.

Specific Proposals: From the website, "Founded in January, 2006, Women of the Storm is a non-partisan, non-political alliance of Louisiana women whose families, businesses and lives were affected by Hurricanes Katrina and Rita. Members, who are culturally, socially and economically diverse, are bound by their passion for their communities.

Women of the Storm's mission is to educate leaders and gain attention to the scale and breadth of devastation caused in the wake of Hurricanes Katrina and Rita by inviting all members of Congress and others who set the national agenda to visit New Orleans and coastal Louisiana to see first-hand the unprecedented damage, the challenges of rebuilding, the signs of progress, and how Louisiana's recovery has a direct impact on every state in the nation.

Women of the Storm operates under the umbrella of a 501-c-3 organization; it is managed by a 12-member executive committee. Hundreds of people have indicated their willingness to help; along with the participation of its national partners LINKS, the Junior League, the Women's Leadership Initiative of United Way and the National Council of Jewish Women, among others."

Publications: Links to press releases can be found at: http://www.womenofthestorm.net/press.php

Other Partners: Partners are listed at this link: http://www.womenofthestorm.net/about_det.php?wots_content_ID=8

State, Regional, and National Non-Governmental Organizations

Center for Planning Excellence (CPEX)
(www.cpex.org)

Social Media Used: Available on Facebook, Twitter, LinkedIn, Vimeo, blog via e-mail subscriptions.

Specific Proposals: CPEX, as stated on their website, approaches their goals of community empowerment through three types of work: dialogue and education, tools and resources, and planning and implementation.

The Toolkit used Smart Growth principles to develop a series of model building codes and ordinances that are custom tailored to the needs of Louisiana communities. The document was designed for use by local governments, private sector developers, neighborhoods, and special advocates. The document provides some guidance for development and elevation in flood zones/flood prone areas, the use of fill or excavation within the 1% zones, and management of floodplains and floodways. The Toolkit may be downloaded free of charge.

Publications: The Louisiana Land Use Toolkit is available through the CPEX website at http://cpex.org/work/louisiana-land-use-toolkit or www.landusetoolkit.com. The Toolkit includes an Implementation Handbook, Zoning Code, Subdivision Code, Additional Ordinances, and Application Forms.

The Louisiana Speaks Regional Plan, an initiative of the Louisiana Recovery Authority, is also available at http://cpex.org/downloads/louisiana-speaks-deliverables.

Publications available at the CPEX website include a "What is a Comprehensive Plan?" factsheet and other documents.

Other Partners: See: http://cpex.org/partners

Comments: Development of the Toolkit was funded by the Louisiana Department of Economic Development (LED) and the Center for Planning Excellence (CPEX), and is based on Louisiana Speaks, a regional plan designed after Hurricanes Katrina and Rita to promote and develop sustainability in south Louisiana.

Coalition to Restore Coastal Louisiana
(www.crcl.org)

Social Media Used: For blog, see: http://www.crcl.org/blog-menu-item.html. To sign up for "Coast Currents," a free, electronic newsletter, see: https://www.thedatabank.com/dpg/316/personal2.asp?formid=signup. Also available on Facebook.

Specific Proposals: The Coalition is a Louisiana based non-profit that seeks to promote a sustainable south Louisiana. According to the organization's website, its Community Based Restoration Program (CBRP) engages volunteers and stakeholders to promote environmental stewardship in Louisiana industries, land owners and business leaders. The CBRP volunteer program provides valuable educational experiences for its participants, who become actively familiar with a wide variety of restoration methods across the entire Louisiana coast. The CBRP also coordinates large-scale restoration projects by bringing together public and private partnerships. These projects have a wider impact on targeted areas of vulnerable wetlands. Since its inception in 2000, the CBRP has engaged more than 9,000 volunteers and directly restored more than 3,700 acres of coastal wetlands in Louisiana."

The CRCL also sponsors the State of the Coast conference, the Louisiana Coastal Stewardship Awards, and numerous other events. The organization is an active partner in numerous planning and policy initiatives that affect the coast.

Publications: See, http://www.crcl.org/learn/archives.html for issues of the Coast Currents newsletter, media reports, and other publications.

Other Partners: The Coalition is part of the Restore the Mississippi Delta coalition, see: www.mississippiriverdelta.org. Retail partners are listed here: http://www.crcl.org/give/retail-partners.html

Environmental Defense Fund
(www.edf.org)

Social Media Used: Available on Facebook and Twitter. Action alerts available here: http://www.edf.org/ecosystems/nursing-gulf-coast-back-health. Delta Dispatches Blog available here: http://www.mississippiriverdelta.org/blog/

Specific Proposals: For 35 years, EDF has worked to support the restoration of Louisiana's coast. Policy advisors assisted with the development of the state's 2012 Coastal Master Plan, and scientists from EDF also work to inform how the state addresses its coastal crisis, including the recovery from the Deepwater Horizon oil spill. For more details, see: http://www.edf.org/ecosystems/nursing-gulf-coast-back-health and http://www.edf.org/ecosystems/restoring-mississippi-river-delta.

Other partners: EDF is part of the Restore the Mississippi Delta coalition, see: www. mississippiriverdelta.org.

Global Green
(www.globalgreen.org/neworleans/)

Social Media Used: Global Green USA has subscription for email newsletters (http://globalgreen.org/getinvolved/). Their blog is located at: http://glovalgreen.org/blogs/global/. Also available on Facebook, Twitter (@globalgreenusa), YouTube, and flickr.

Specific Proposals: As stated on their website, Global Green responded to Hurricane Katrina through smart solutions to climate change and the green rebuilding of New Orleans and the Gulf Coast. Global Green unveiled as aggressive plan to rebuild New Orleans, including:

- The Holy Cross Project – Building a sustainable low-income housing community for New Orleans's Ninth Ward.
- Green Schools Initiative
- Improved policy in New Orleans and the Gulf Coast – Working with local and state authorities to implement green rebuilding policies.
- The Green Building Resource Center – the New Orleans office serves as a focal point for the community and is a beacon for sustainable building and design.

Publications: See: http://www.globalgreen.org/articles/global/78

Other Partners:

- The Holy Cross Project – funding from the Home Depot Foundation
- Green Schools Initiative – grant from the Bush Clinton Katrina Fund

Hundreds of other individuals, organizations and foundations are cited as Global Green sponsors at: http://globalgreen.org/i/file/AR2008_DONORS.pdf

Going Up, Going Green (GUGG)

Social Media Used: For overview, see: http://vimeo.com/57016568

Specific Proposals: Southern Louisiana is particularly vulnerable to hurricanes and floods; therefore homes must be built to withstand these conditions. It is also imperative that construction efforts incorporate materials and designs that mutually benefit the environment and the homeowner. Despite these needs, there is no prescriptive code for pier and beam foundations in the International Residence Code (IRC).

The Going Up, Going Green project will demonstrate cost and safety factors that may be used to develop uniform codes for the construction of homes on piers. These 'field classrooms' will provide unique opportunities for training programs for the construction industry and other groups and will help create an understanding of how to achieve greater energy and resource efficiency. The public will be invited to tour the three homes through a variety of scheduled training sessions and classes, as well as on free open house days. Special events and trainings can be arranged with the builder.

Best practices learned from this project will be submitted formally to the Louisiana State Uniform Construction Code Council (LSUCC) and the International Residential Code Council in hopes of improving standards and educational programming for members of the construction industry and other groups.

Publications: See: http://www.lsuagcenter.com/en/family_home/home/la_house.

Other Partners:
- RaisedFloorLiving.com
- Southern Pine Council
- Southern Forest Products Association
- APA — The Engineered Wood Association
- LSU AgCenter

Gulf Future: A Unified Action Plan for a Healthy Gulf

(www.gulffuture.org/)

Social Media Used: Gulf Future blog: http://www.gulffuture.org/rss/1.html. Also available on Facebook, Twitter and Digg.

Specific Proposals: As stated on the website, The Gulf Future Campaign was created shortly after the BP oil disaster of 2010 to provide the long-term support needed to protect the environment and the distinct culture of the Gulf Coast for future generations. See publications below.

Publications: The group has published a Unified Action Plan and the Weeks Bay Principles of Gulf recovery, both of which contain related proposals.

- http://www.gulffuture.org/supporting-organizations/gulf-restoration-network.html
- http://www.gulffuture.org/campaign/the-weeks-bay-principles-for-gulf-recovery.html

Also see "Sunshine on the Gulf: The Case for Transparency in the Restoration Project Selection." Additional resources and reports are located at http://www.gulffuture.org/resources/organizational-resources-and-reports.html.

Other Partners: The site lists the forty-eight (48) organizations that support the Gulf Future Campaign. The site is hosted by the Gulf Restoration Network (http://healthygulf.org/), which has 44 partner groups. Those who align themselves as Partner Groups receive information and free technical assistance at no charge. Twenty-nine foundations and other organizations provide financial support.

Comments: On October 4-6, 2010, ninety-five people representing forty-six communities, local, regional, national and international environmental, social justice, and fishermen's groups met at the Beckwith Camp and Conference Center on Weeks Bay, Alabama. Together, they drafted the goals and principles that they believe must guide the recovery and restoration of the Gulf of Mexico, the coast and the communities in the wake of the BP drilling disaster. See link above for copy of document.

In March 2011, these and other organizations reconvened to develop a plan for action. The Gulf Future Unified Action Plan for a Healthy Gulf was released on April 20, 2011, the one- year memorial of the Deepwater Horizon explosion. See link above for copy of document.

Gulf of Mexico Alliance (GOMA)

(www.gulfofmexicoalliance.org/index.php)

Social Media Used: Sign up for e-Newsletters at http://www.gulfofmexicoalliance.org/announcements/index.php#goma_news

Specific Proposals: According to their website, the alliance is a "PARTNERSHIP of the states of Alabama, Florida, Louisiana, Mississippi, and Texas, designed to enhance the ecological and economic health of the Gulf of Mexico. GOMA has identified PRIORITY ISSUES that are regionally significant and can be effectively addressed through increased collaboration at local, state, and federal levels."

Publications: For publications, see: http://www.gulfofmexicoalliance.org/community/pubs.html. A number of Regional Tools can be viewed at the following link: http://www.gulfofmexicoalliance.org/community/tools.html

Other Partners: The alliance's partnerships are extensive and can be seen at the link above.

How Safe How Soon

(www.law.tulane.edu/uploadedFiles/Institutes_and_Centers/Water_Resources_Law_and_Policy/Documents/How_Safe_How_Soon_Flyer.pdf)

Specific Proposals: This project represents a collaborative effort between communities, non-profits, academic institutions, and others. The focus is on creating more resilient communities. Projects include rain gardens, preparedness workshops, and neighborhood flood analyses.

Publications: Project flyer found online specifically about How Safe How Soon and PowerPoint presentation on project: http://www.americasenergycoast.org/052610-AEC-Jackson.ppt. Also see a 2008 web post by the United Houma Nation (http://www.unitedhoumanation.org/node/713), and related article: (http://www.houmatoday.com/article/20091214/ARTICLES/912149975/1282?Title=La-Indian-village-holds-out-against-plea-to-move)

Other Partners: The project partners, according to a flyer, are as follows:

- Lower Ninth Ward
- Center for Sustainable Engagement and Development
- Carrollton-Hollygrove Community Development Corporation (http://crna-nola.org/ or http://hollygrovemarket.com/)
- United Houma Nation, Environmental Defense Fund
- Tulane Institute on Water Resources Law and Policy
- Coalition to Restore Coastal Louisiana
- Center for Hazard Assessment, Response and Technology (CHART).

Lake Pontchartrain Basin Foundation

(www.saveourlake.org)

Social Media Used: Sign up here for email bulletins: http://visitor.r20.constantcontact.com/manage/optin/ea?v=001rlsB_VLrUOk51sMSCioQOg%3D%3D. Also available on You Tube and Facebook.

Specific Proposals: From the website, "As the public's independent voice, Lake Pontchartrain Basin Foundation (LPBF) is dedicated to restoring and preserving the water quality, coast, and habitats of the entire Pontchartrain Basin. Through coordination of restoration activities, education, advocacy, monitoring of the regulatory process, applied scientific research, and citizen action, LPBF works in partnership with all segments of the community to reclaim the Basin for this and future generations. The LPBF is also working on broader coastal issues in order to support efforts to restore coastal Louisiana.

Publications: For bulletin archives, see: http://www.saveourlake.org/news-and-alerts.php. For environmental education resources, see: http://www.saveourlake.org/education-resources.php. Smart growth and other planning resources are found here: http://www.saveourlake.org/habitat-resources.php

Other Partners: The Lake Pontchartrain Basin Foundation is a partner in the Restore the Mississippi Delta campaign. See: www.mississippiriverdelta.org.

Comments: From the website, "The Lake Pontchartrain Basin is a 10,000 square mile watershed encompassing 16 Louisiana parishes. The land use of the region is both rural and urban and is the most densely populated region in Louisiana, including metro New Orleans and the state capital, Baton Rouge. It is one of the largest estuarine systems in the Gulf of Mexico containing over 22 essential habitats. The Basin's topography ranges from rolling woodlands in the north to coastal marshes in the south, with the 630 square mile Lake Pontchartrain as its centerpiece."

Make It Right Foundation

(www.makeitrightnola.org/)

Social Media Used: The organization uses Facebook, Twitter, and YouTube. To sign up for newsletters, go to: https://app.etapestry.com/hosted/MakeItRightFoundation/Newsletter.html. Blog sign up is available here: http://www.makeitrightnola.org/index.php/media/blog/)

Specific Proposals: Actor Brad Pitt established this organization two years after the devastation of Hurricane Katrina when he noted no progress had been made in rebuilding in the Lower Ninth Ward, despite the community's determination to rebuild. Make it Right aims to build 150 green, affordable, high-quality design homes in the 16 block neighborhood closest to the 9th Ward levee breach. Make it Right has built over 80 sustainable, LEED Platinum certified homes. They have earned the highest distinction of energy efficiency and sustainability, LEED Platinum, by integrating and aggregating a variety of cutting edge construction materials and techniques.

Recently, the nonprofit has partnered with the city of New Orleans on an innovative pilot program to evaluate pervious concrete as a possible replacement for major portions of traditional roadways. "We're in the testing phase right now, but the Lower 9th Ward could have one of America's first zero-runoff streets," states Cesar Rodriguez of Make it Right. "We get 60 inches of rain a year in New Orleans and it costs the city about two cents per gallon to pump the water over the levee. Pervious concrete roads cost more upfront, but they could potentially save the city 20 to 25 million dollars a year." (http://www.bobvila.com/articles/1255-brad-pitt-s-make-it-right-homes/pages/2)

The first permitted floating home in the U.S. (FLOAT House) was completed by Make It Right. Additional information regarding FLOAT Houses can be seen at http://www.makeitrightnola.org/index.php/media/press/morphosis_float_house_completed_for_make_it_right_foundation/.

Publications: *Architecture in Times of Need – Make It Right Rebuilding New Orleans, Lower Ninth Ward* documents the progress of the Make It Right Foundation. An archive of videos, news articles, and press releases related to the Foundation is located at http://www.makeitrightnola.org/index.php/media/.

Comments: As stated on their website, the Foundation began with the "Pink Project," an art installation designed to bring attention to the challenges and possibilities of rebuilding the Lower Ninth Ward. The Pink Project raised $12 million.

Mississippi River Network

(www.1mississippi.org/about-us/)

Social Media Used: Blog link: http://1mississippi.org/category/blog/. To become a "River Citizen" and stay informed about how to protect the river, see: http://org2.democracyinaction.org/o/7288/p/salsa/web/common/public/signup?signup_page_KEY=6075

Specific Proposals: From the website: "1 Mississippi is supported by the Mississippi River Network (MRN) to encourage River Citizens through education, inspiration and opportunities to embrace the Mississippi River. The goal of the Network is to protect the land, water and people of the United States' greatest River. Founded in 2005, the Network has grown into a diverse coalition of 45 nonprofit organizations and businesses from the River's headwaters in Minnesota, to where it drains into the Gulf of Mexico. Coordinated by Biodiversity Project, a nonprofit organization of communications and coalition-building specialists, Network members share resources, implement whole River strategies and support the 1 Mississippi national campaign.

The Network focuses on three priority issues that need river-wide cooperation:

- Establish a national commitment to protect and restore the Mississippi River through increased public awareness and support.
- Promote Farm Bill Conservation Practices throughout the Mississippi River Basin.
- Encourage reliance on natural infrastructure and restoration of wetlands and flood plains. This includes implementing the Principles & Requirements for water project planning and decision-making, as required by the Water Resources Development Act.

National Wildlife Federation (NWF)

(www.nwf.org)

Social Media Used: Available on Facebook, Twitter, flickr, and You Tube. Blog: http://blog.nwf.org/blog/tags/BP-oil-spill/feed/ and http://www.mississippiriverdelta.org/blog/. RSS feeds: current news, wildlife promise and national wildlife (http://www.nwf.org/News-and-Magazines.aspx) .

Specific Proposals:

For information on the Deepwater Horizon oil spill and related activities of NWF, including sections on helping wildlife recover and reforming offshore drilling policy, see: www.nwf.org/Oil-Spill.aspx

The NWF's Louisiana team has a strong outreach component oriented toward supporting community resilience in the face of a changing coast. See: http://www.nwf.org/South-Central-Region.aspx

Publications: See website for newsletter and magazine publications.

Other Partner Agencies: The NWF works with Environmental Defense Fund and the National Audubon Society, along with other national and local organizations, as part of the Restore the Mississippi River Delta Campaign. (www.mississippiriverdelta.org/).

OXFAM America's Coastal Communities Initiative

(www.oxfamamerica.org/campaigns/us-gulf-coast-recovery)

Social Media Used: Blog sign up: http://act.oxfamamerica.org/site/PageServer?pagename=eComm_Register. OxFam America is also available on Facebook, Twitter, YouTube, flickr, RSS feed (http://www.oxfamamerica.org/campaigns/us-gulf-coast-recovery/latest/search_rss) and SMS updates (text OXFAM to 30644).

Specific Proposals: The website states, "Oxfam is committed to increasing community resiliency along the coast and ensuring that residents of the region are well equipped to continue the Katrina and BP oil spill recovery, and build their communities back stronger than before. Oxfam's immediate response to the hurricanes grew quickly into a five-year, $12 million program in Mississippi and Louisiana, focusing on safe and affordable housing as well as worker and immigrant rights. The program is combining financial support to key partner organizations with on-the-ground technical support as it focuses on addressing long standing regional issues including coastal restoration and economic development based on green jobs."

Publications: Oxfam America references two publications as the "foundation" for their current work in the Gulf Coast. Oxfam America is the lead organization (with many others organizations listed as endorsers) for a 2010 planning document called One Gulf Resilient Gulf: A Plan for Coastal Community Recovery: http://www.oxfamamerica.org/files/one-gulf-resilient-gulf.pdf . A second 2009 document presents research on the impact of climate change on a thirteen state region of the southeastern United States: http://www.oxfamamerica.org/publications/exposed-social-vulnerability-and-climate-change-in-the-us-southeast.

Additional publications include:

- Beyond Recovery: Moving the Gulf Coast Toward a Sustainable Future
- Impact of climate change on response providers and socially vulnerable communities in the US

Other Partners: Oxfam works extensively with community organizations throughout the Gulf. Oxfam is also a partner in the Restore the Mississippi River Delta campaign (www.restorethemisssippi.org).

Restore the Mississippi River Delta

(www.mississippiriverdelta.org/)

Social Media Used: Facebook, Twitter, and blog: http://www.mississippiriverdelta.org/blog/. Delta Dispatches blog available here: www.mississippiriverdelta.org/blog/

Specific Proposals: As described on the website, the campaign is a joint effort among the National Wildlife Federation, Environmental Defense Fund, and the National Audubon Society, along with local partners the Coalition to Restore Coastal Louisiana and the Lake Pontchartrain Basin Foundation to bring about comprehensive, systemic restoration of the Mississippi River delta. The group is working to find and seek consensus and national support for an ecologically sound and sustainable program to restore the flow of the Mississippi River to its dying delta, and to do so in a way that preserves the communities and culture of coastal Louisiana to the maximum extent possible.

Three goals have been established:

1. Establish a multi-disciplinary, joint state and federal governance team with authority, capacity and leadership to implement a plan.

2. Secure adequate funding to implement a Mississippi River Delta restoration plan.

3. Expand the understanding of what is possible for Mississippi River Delta restoration through science, economics, restoration project implementation and increasing public support for delta restoration.

Publications: In 2010, three of the partners agencies (the National Wildlife Federation, the National Audubon Society and the Environmental Defense Fund) published a white paper, "Common Ground: A Shared Vision for Restoring the Mississippi River Delta" which can be found at http://www.nwf.org/~/media/PDFs/Wildlife/Louisiana-Restoration-White-Paper.ashx.

In 2012, the coalition's science and engineering special team published, "Answering Ten Fundamental Questions About the Mississippi River Delta." http://www.mississippiriverdelta.org/files/2012/04/MississippiRiverDeltaReport.pdf

Other Partners:
- Louisiana Wildlife Federation
- MRGO Must Go Coalition
- Oxfam
- Ocean Conservancy
- Nature Conservancy
- Ocean Conservancy

South Louisiana Wetlands Discovery Center (SLWDC)

(www.slwdc.org/)

Social Media Used: Available on Facebook and Twitter.

Specific Proposals: The mission of the SLWDC is to provide an educational resource that uses the ecology of the Gulf Coast as the focus of experiential learning and expands existing resources in science, mathematics, and technology. Through the use of interactive exhibits and displays, the dynamics of the Discovery Center serves to encourage a passion in local citizens and eco-tourists to conserve and preserve the Louisiana Wetlands.

Publications: Annual newsletters have been archived at http://www.slwdc.org/newsletters/newsletters.html.

Other Partners: Local sponsors are listed on the website (http://www.slwdc.org/sponsors.html).

Comments: As stated on the website, the South Louisiana Wetlands Discovery Center (SLWDC) began as a project of the Houma Downtown Development Corporation (HDDC) in the late 90s. In 2002, a new group was formed, called the Friends of South Louisiana Wetlands Discovery Foundation. A technical advisory board state commission were formed in subsequent years. The boards and commission are composed of a cross section of members from the local community. SLWDC has one paid staff member. The SLWDC has been designated as an America's Wetland resource site.

Tulane Institute on Water Resources Law and Policy

(www.law.tulane.edu/tlscenters/enlaw/index.aspx?id=9922)

Social Media Used: Blog: http://www.law.tulane.edu/tlscenters/enlaw/blog.aspx

Specific Proposals: As stated on the website, the Institute's mission is to foster the development of laws and policies that promote sustainable management of water resources. Although, the institute's area of focus is Louisiana and the Gulf Coast, its sphere of activity is national and international.

The Institute has five program areas:

1. The Stewardship of Water Resources - program area focuses on building the capacity for stewardship of water resources locally in Louisiana and nationally.
2. The Living with Water Program: Redefining Louisiana's Relationship to Water is based on the understanding that water and related infrastructure and ecosystems shape communities and that water scarcity, access and management are all related.
3. Managing Louisiana's Water Wealth--Louisiana, a state with exceptional water wealth, has historically taken that wealth for granted. As a result of the changing environmental climate in Louisiana, the United States and the world, a key aspect of the Institute's mission is to contribute to Louisiana's shift toward sustainability by illuminating the state's water laws and by fostering laws and policies that promote better water stewardship.
4. The objective of the Coastal Restoration, Protection and Conservation program area is to spur the creation of improved water policies in Louisiana. This includes expanding the existing Stakeholder Atlas of Coastal Louisiana and initiating the creation of a Coastal Land Trust.
5. The Institute's expansive Outreach and Education efforts include partnerships with a wide array of organizations, lectures series and symposia, and classes offered at Tulane Law School.

Publications: Published articles, reports, presentations and Tulane Environmental Law newsletters can be found at http://www.law.tulane.edu/tlscenters/enlaw/index.aspx?id=9968, some of which are:
- Not by Accident: Building a Sustainable New Orleans
- To What End: Resilience, Tradeoffs, and the Lessons of Katrina
- A Whole New Ballgame: Coastal Restoration, Storm Protection, and the Legal Landscape After Katrina

Water Institute of the Gulf
(thewaterinstitute.org)

Social Media Used: None available. The website above has information about research projects being undertaken and principles informing the institute's work.

Specific Proposals: From the website, "The Water Institute of the Gulf is a not-for-profit, independent research institute dedicated to advancing the understanding of coastal, deltaic, river and water resource systems, both within the Gulf Coast and around the world. Our mission supports the practical application of innovative science and engineering, providing solutions that benefit society." The institute's work may encompass nonstructural measures in future years.

Publications: See: http://thewaterinstitute.org/products/publications/

Other Partners: The Baton Rouge Area Foundation and the Louisiana Coastal Protection and Restoration Authority both provided start-up funding.

State Agencies and Programs

Coastal Wetlands Planning, Protection and Restoration Program (CWPPRA)
(www.lacoast.gov)

Social Media Used: CWPPRA Newsflash available by sending an email to: ListServer@nwrccom.cr.usgs.gov with the subject "subscribe cwppra" (without the quotation marks). The newsflash site is: http://lacoast.gov/new/News/Newsflash.aspx. All CWPPRA projects, including locations, cost estimates and net acres benefitted, can be found at http://lacoast.gov/new/Projects/List.aspx

Specific Proposals: The U.S. Congress enacted the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) of 1990 in response to Louisiana's land loss crisis. CWPPRA was the first federal, statutorily mandated program with a stable source of funds dedicated exclusively to the short- and long-term restoration of the coastal wetlands of Louisiana. Between 1990 and 2008, 77 restoration projects were constructed through the CWPPRA program. These projects include diversions of freshwater and sediments to improve marsh vegetation; dredged material placement for marsh creation; shoreline protection; sediment and nutrient trapping; hydrologic restoration through outfall, marsh, and delta management; and vegetation planting on barrier islands. (August 2010 Summary)

Publications: A variety of publications are available at http://lacoast.gov/new/Pubs/Default.aspx.

These include:
- CWPPRA Flyer
- WaterMarks Magazine
- Coastal Louisiana and South Florida: A Comparative Wetland Inventory
- CWPPRA Project Fact Sheet - Booklet Builder (contains fact sheets based on Parish, Congressional District, PPL, CWPPRA Agency, and Basin filters) available at http://lacoast.gov/new/Projects/booklet.aspx.

Reports: CWPPRA Reports are available at: http://lacoast.gov/new/Pubs/Reports/Default.aspx. A sample of those available includes:
- CWPPRA Legislative History http://lacoast.gov/new/Data/cwppra_compiled-legislation.pdf
- CWPPRA Summary of Wetland Benefits for Priority List Projects http://lacoast.gov/new/Projects/PPL/default.aspx
- Barrier Island Reports http://lacoast.gov/new/Pubs/Reports/Default.aspx
- Saving Coastal Louisiana: A National Treasure - Recommendations for Implementing an Expanded Coastal Restoration Program from the Committee on the Future of Coastal Louisiana, February 2002. (http://www.lacoast.gov/cwppra/reports/saving_coastal_louisiana.pdf)

Maps and Imagery: CWPPRA has developed maps and satellite imagery that details project sites, vulnerable areas, and estimated land loss images through 2050. Those maps and images are available for download from the CWPPRA website, http://lacoast.gov/new/Pubs/Maps.aspx

Videos: CWPPRA Videos are available for viewing at: http://lacoast.gov/new/Pubs/videos.aspx
- Rebuilding Coastal Louisiana
- Marsh Creation – Step by Step
- Meet the CWPPRA Task Force
- Louisiana Coastal Land Loss Simulation 1932-2050

Other Partners: CWPPRA is managed by a task force of five federal agencies. Agency names and representatives are listed below:

- U.S. Environmental Protection Agency (EPA) – William Honker
- U.S. Fish and Wildlife Service (USFWS) – Jim Boggs
- USDA-Natural Resources Conservation Service (NRCS) – Kevin Norton
- NOAA-National Marine Fisheries Services – Christopher Doley
- U.S. Army Corps of Engineers (USACE) – Col. Edward R. Fleming (Chair)
- Governor's Office of Coastal Activities – Garret Graves

Other CWPPRA partners:

- Gulf of Mexico Energy Security Act (GOMESA)
- Coastal Protection and Restoration Authority of Louisiana (CPRA)
- Coastal Impact Assistance Program (CIAP)
- Louisiana Coastal Area (LCA)
- Davis Pond Freshwater Diversion
- Coast 2050
- Brown Marsh DIMS
- Barataria-Terrebonne National Estuary Program (BTNEP)
- Coalition to Restore Coastal Louisiana
- Lake Pontchartrain Basin Foundation
- Gulf of Mexico Alliance

Comments: The CWPPRA Progam does not differentiate between structural and non-structural mitigation. The program's primary goal is to protect and restore coastal wetlands through a variety of projects that best benefit a specific site or location as determined by the type of wetland loss, damage, or destruction.

Louisiana Coastal Protection and Restoration Authority

(www.coastal.louisiana.gov/)

Social Media Used: RSS feed: http://coastal.louisiana.gov/index.cfm?md=newsroom&tmp=rss&catid=7&nowrap=1

Specific Proposals: From the website, "The Coastal Protection and Restoration Authority's mandate is to develop, implement and enforce a comprehensive coastal protection and restoration master plan. For the first time in Louisiana's history, this single state authority will integrate coastal restoration and hurricane protection by marshalling the expertise and resources of the Department of Natural Resources, the Department of Transportation and Development and other state agencies, to speak with one clear voice for the future of Louisiana's coast. Working with federal, state and local political subdivisions, including levee districts, the CPRA will work to establish a safe and sustainable coast that will protect our communities, the nation's critical energy infrastructure and our bountiful natural resources for generations to come. The CPRA of Louisiana was established by Act 8 of the 1st Extraordinary Session of 2005."

The 2012 Master Plan for the Coast included an extensive nonstructural program budgeted at $6 billion over the next 50 years. This program included both programmatic measures, such as land use ordinances, and physical measures, such as elevation of homes. However, the plan did not provide details about what these measures should be and how they should be implemented. The implementation arm of the CPRA is working to answer these questions. The office is undertaking a Coastal Community Resiliency Program that will include the participation of a subcommittee of the CPRA as well as an advisory group. This work will explore how best to bring nonstructural solutions to Louisiana communities.

Publications:

- Louisiana's 2012 Coastal Master Plan, see: www.coastalmasterplan.louisiana.gov/
- Numerous projects are described at this link: http://coastal.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&nid=78&pnid=0&pid=97&catid=0&elid=0
- The website's library section also contains links to past publications: (http://coastal.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&nid=76&pnid=0&pid=66&catid=0&elid=0

Other Partners:

Office of the Governor

- Coastal Activities - Handles coastal activity policy and legislative issues; the governor's Executive Assistant for Coastal Affairs is the Chairperson of the CPRA

Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA)

- Provides funding for Louisiana's coastal restoration and projects
- Projects provide near-term conservation of wetlands

Army Corps of Engineers (USACE)

- Provides comprehensive water resources management to include navigation
- Hurricane and storm damage risk reduction
- Environmental stewardship for Louisiana to ensure public safety and benefit the nation

Louisiana Department of Insurance/ Residential Property Storm Mitigation Incentives

(www.ldi.state.la.us)

Social Media Used: No mailing list or blog available, but Louisiana Department of Insurance (LDI) website provides some press release information and a tri-fold pamphlet for printing. The website is www.ldi.state.la.us. LDI is also available on Facebook and Twitter.

Specific Proposals: This initiative provides residential property owners with storm mitigation incentives, such as insurance premium deductions and state tax deductions.

Publications: Generic flyer issued by LDI to provide information regarding mitigation measures and incentives for homeowners: (http://www.ldi.state.la.us/consumers/misc_pubs/Residential_Property_Storm_Mitigation.pdf).

Comments: Following the adoption of the Louisiana State Uniform Construction Code in 2005, the following incentives were developed and are provided under the Louisiana Legislature's 2007 Regular Session Acts 323, 467, and 462 respectively:

Insurance premium discounts are available in 2008 to home owners who build or retrofit a structure to comply with the requirements of the State Uniform Construction Code, install damage mitigation improvements, or retrofit their property utilizing construction techniques demonstrated to reduce the amount of loss from a windstorm or hurricane. Act 323 of the 2007 Regular Session provides these discounts for insureds effective after insurers file rates to include the discounts with the Louisiana Department of Insurance between March 31, 2008 and January 1, 2009. Premium discounts are granted based on damage mitigation improvements and construction techniques listed on the Louisiana Hurricane Loss Mitigation Form. These damage mitigation improvements and construction techniques include but are not limited to:

- buildings designed to code;
- roof bracing;
- secondary water barriers;
- opening protection;
- roof-to-wall strength;
- roof deck attachment;
- roof covering and roof covering performance;
- wall-to-floor-to-foundation strength;
- window, door, and skylight strength;
- and other mitigation improvements and/or construction techniques that the insurer has determined to reduce the risk of loss due to wind.

A second storm mitigation incentive made available in the 2007 Regular Session by Act 467 is state income tax deductions for insured residents who voluntarily retrofit an existing residential structure to bring it into compliance with the State Uniform Construction Code. This construction code retrofitting deduction is an amount equal to 50 percent of the cost paid or incurred for the retrofit on or after January 1, 2007, less the value of any other state, municipal or federally-sponsored financial incentives for the cost paid. The taxpayer must claim the homestead exemption for the home being retrofitted; the home cannot be rental property. The tax credit can be no more than $5,000 per retrofitted residential structure and is claimed on the tax return for the year in which the work is completed.

A third storm mitigation incentive made available in the 2007 Regular Session by Act 462 allows insured residents to receive exclusions on state sales and use tax when purchasing storm shutter devices that provide window damage protection in a storm or hurricane, effective July 1, 2007.

Louisiana Governor's Office of Homeland Security and Emergency Preparedness

(www.getagameplan.org and www.gohsep.la.gov/)

Social Media Used: AlertSense is a free weather and emergency alert service sent to your cell phone. A Twitter account can be found at twitter.com/gohsep.

Specific Proposals: The website provides information regarding emergency planning, preparedness, and mitigation for residents, families, children and businesses in Louisiana. The site breaks information down into "before" and "during" an event as well as evacuation information and important numbers.

Publications:

Evacuation

- Official Louisiana Hurricane Survival Guide – provides Louisiana contraflow maps, hurricane and evacuation related information in English, Spanish, and Vietnamese. (http://www.getagameplan.org/evacInfo.htm)

Family Plan

- Emergency Kit checklist (webpage viewing and printing only)
- Preparation checklist (webpage viewing and printing only) including evacuation planning information, protecting your home and valuables.
- Special Needs Guide (downloadable format)
- Caring for pets, cattle and horses.

Business Plan
- Links to ready.gov
- Information provided on:
  - Continuity Planning
  - Staff training and preparedness
  - Investment Protection

Mitigation Plan
- Funding Hazard Mitigation Workbook - http://www.getagameplan.org/media/2%20Funding%20Hazard%20Mitigation%20Workbook/GOHSEP_FHM_Workbook.pdf
- Funding Hazard Mitigation Non-Disaster and Disaster Resource Reference - http://www.getagameplan.org/media/2%20Funding%20Hazard%20Mitigation%20Workbook/GOHSEP_FHM_Workbook.pdf
- Instruction Guide (for the preceding two books) - http://www.getagameplan.org/media/1%20Read%20Me%20First/Instruction%20Guide%20for%20Funding%20Hazard%20Mitigation%20Workbook%20and.pdf
- Links to AgCenter LaHouse (see one-pager)
- Links to LA State Hazard Mitigation Plan
- Links to other helpful website.

PSAs
- Be Prepared for Hurricane Season
- Be Prepared for Emergencies, Have a Plan
- Rain/Flooding Storm Awareness
- Game Plan Gator (for children)
- Storm Protect Your Home – All Hazards
- Storm Protect Your Home – High Winds, Trees, and Limbs
- Storm Protect Your Home Against Flooding
- Storm Protect Your Home Against High Water
- Storm Protect Your Home Against High Winds Using Braces or Storm Clips
- Tornado Safe Rooms
- Insurance
- Manufactured Homes
- High Ground

Other Partners:
- LSU AgCenter
- FLASH
- www.disastersafety.org
- www.blueprintforsafety.org

Louisiana Oil Spill Coordinator's Office/NRDA Response to Deepwater Horizon Spill

(http://losco-dwh.com)

Specific Proposals: As stated on the website, the Natural Resource Damage Assessment (NRDA) is a legal process under the Oil Pollution Act of 1990 (OPA) and the Louisiana Oil Spill Prevention and Response Act of 1991 (LOSPRA) whereby designated trustees represent the public to ensure that natural resources injured in an oil spill are restored. The Oil Pollution Act authorizes certain federal agencies, states and Indian tribes, collectively known as the Natural Resource Trustees (Trustees) to evaluate the impacts of an oil spill on natural resources. Trustees are charged with making the environment and the public whole for injuries to natural resources and services resulting from an incident involving a discharge of oil or substantial threat of a discharge of oil. Making the environment whole includes both restoring injured resources to the condition they would have been in but for the discharge as well as compensating for the temporal loss of natural resources, and the ecosystem services they provide, from the time of injury until the time they are fully restored.

LOSCO is serving as the lead administrative trustee for the NRDA process that has followed the Deepwater Horizon oil spill.
- To submit restoration project ideas, see: (http://losco-dwh.com/RestorationProject/ProjectInfoSheet.aspx)
- See this site for a list of submitted restoration project ideas: (http://losco-dwh.com/SubmittedRestorationList.aspx).

Publications: Numerous work plans can be found on the website (http://losco-dwh.com/viewworkplans.aspx) as well as pre-assessment science data (http://losco-dwh.com/NRDAdata.aspx).

Other Partners: The federal trustees for this project are:

The Department of Commerce
- National Oceanic and Atmospheric Administration

The Department of the Interior
- Fish and Wildlife Service
- National Park Service
- Bureau of Land Management
- Bureau of Indian Affairs

The Department of Defense
- Navy

The Louisiana trustees for this project are:
- Coastal Protection and Restoration Authority (Louisiana) lead trustee
- Louisiana Oil Spill Coordinator's Office, lead administrative trustee
- Louisiana Department of Environmental Quality
- Louisiana Department of Wildlife and Fisheries
- Louisiana Department of Natural Resources

Additional state offices are providing support to the NRDA process:
- Governor's Office of Homeland Security and Emergency Preparedness (Louisiana)
- Emergency Louisiana (Louisiana)
- Deepwater Horizon Response (USA)
- Louisiana Governor's Office (Louisiana)

Louisiana Sea Grant College Program
(www.laseagrant.org)

Social Media Used: Louisiana Sea Grant offers several different RSS feeds for their College Program, Fisheries, Law & Policy Program and Marine Education Resouces (LaMER) (http://www.laseagrant.org/rss.htm). Also available on Twitter, YouTube and flickr.

Specific Proposals: From the website: "Louisiana Sea Grant's strategic initiatives address four issues identified as especially pertinent to state, regional and national needs: healthy coastal ecosystems, sustainable coastal development, safe and sustainable seafood, and hazard resilience in coastal communities. Several goals have been chosen for emphasis within each area, and specific two-year objectives have been identified in the Louisiana Sea Grant Implementation Plan (http://www.laseagrant.org/pdfs/LA_SeaGrant_Initiatives2011.pdf)."

Publications: As stated on the website, Louisiana Sea Grant publishes newsletters, fact sheets, booklets, and brochures on a broad range of topics related to sustaining the coastal and marine environment. Copies of most are available by mail, and many (including out of print Louisiana Sea Grant publications) may be borrowed from the National Sea Grant Library, an archive of all Sea Grant-funded documents. See this site for links to search either the Louisiana or National Sea Grant Libraries: http://www.laseagrant.org/comm/pubs.htm. See also the "Magazines and Bulletins" section of the website, which offers archived copies of their self-published Coastal Clips magazine and Coast & Sea magazine, recent reports, fact sheets.

"Hazard Mitigation and Land Use Planning in Coastal Louisiana, Recommendations for the Future," by the Louisiana Sea Grant College Program and the Louisiana State University, looks at the integration of hazard mitigation and land use planning into a comprehensive plan, particularly after the impacts of Katrina and Rita. http://www.lsu.edu/sglegal/pdfs/CompPlanningReport.pdf.

Other Partners: (http://www.laseagrant.org/about/partners.htm). See also the Mississippi-Alabama Sea Grant Consortium (MASGC) - http://www.masgc.org/page.asp?id=3

Comments: From the website, "Louisiana Sea Grant, based at LSU, is part of the National Sea Grant Program, a network made up of 32 programs located in each of the coastal and Great Lake states and Puerto Rico. Sea Grant Programs work individually and in partnership to address major marine and coastal challenges. Congress established the National Sea Grant College Program, which is now administered by the National Oceanic and Atmospheric Administration (NOAA) in 1966. The Louisiana Sea Grant College Program was established in 1968 and has worked to promote stewardship of the state's coastal resources through a combination of research, education and outreach programs critical to the cultural, economic and environmental health of Louisiana's coastal zone."

The Louisiana State University Agricultural Center (LSU AgCenter) LaHouse
(www.lsuagcenter.com/en/family_home/home/la_house/)

Social Media Used: The AgCenter is available on Facebook, Twitter, RSS and blogs. The AgCenter has a blog page for their website at http://www.lsuagcenter.com/en/blogs/.

Specific Proposals: The LaHouse-Home and Landscape Resource Center is a research based showcase of solutions and educational outreach programs to help Louisiana residents create homes that offer: MORE comfort, durability, value, convenience, environmental quality, safety and better health with LESS energy, water, pollution, waste, damage and loss. The LaHouse includes a permanent, evolving showcase home, seven acres of educational landscape exhibits, a teaching center and

exhibit space, and educational outreach to consumers, professionals, and youth. The facility/program addresses the following national and regional challenges:

- Energy independence
- Hurricanes and floods
- Pollution prevention
- Waste management
- Asthma, mold, and other indoor air hazards
- Barriers to technology transfer
- Unstable fuel costs
- Formosan subterranean termites
- Warm, humid climate
- Threatened drinking water supplies
- Aging population
- Economic vitality

My House, My Home is a program designed to help home buyers/builders/remodelers develop a high-performance home. Upcoming and recurring events include lunch and learn series on water conservation using micro irrigation and Lead Certified Renovator Training (RRP). Principles and benefits are outlined in guidance documents with the following headings:

- Strategic investment
- Building science facts and fallacies
- Energy-efficient
- Earth friendly
- Durable
- Hazard-resistant
- Healthy
- Convenient and practical

Publications: LaHouse publications include the following and are located at http://www.lsuagcenter.com/en/family_home/home/la_house/publications/:

- Building Your High-Performance Home: Gulf Region Homeowners Guide
- Insulating Raised Floors in Hot, Humid Climates
- LaHouse Home & Landscape Resource Center: Flood, Wind and Water Resistance Features Used in Building LaHouse
- Improve Your Home and Profit: Make It Stronger, Safer, Smarter
- The Safer, Stronger, Smarter Louisiana House: Hurricane Edition

My House, My Home publications are located here: http://www.lsuagcenter.com/en/family_home/home/la_house/my_house/. They include:

- Your Convenient and Practical Checklist (explores components and features of a sustainable Louisiana house)
- Weigh What's Possible with What's Practical: More Is Not Always Better
- Balance Benefits of Building Systems: Buildings that Integrate and Balance the Five Criteria for a Sustainable, High-performance Home
- Plan to Future-Proof Your Home: Consider Advanced Wiring and Adaptable Spaces.
- Building Systems: High-performance Options
- Key Building Science Principles: Essential Pieces of the Puzzle
- Geographic Basics: Location, Location, Location
- Heat Basics: Why Insulation Isn't Enough
- Air Basics: The Invisible Transporter
- Moisture Basics: Clues to Moisture Problem Mysteries
- Resulting Rules to Remember in the South
- Important Building Material Insights
- Tight Construction for a Continuous Air Barrier
- Insulation Systems with Good "Whole Wall" R-Values
- Design for the Climate
- Protecting Water Quality
- Minimize Use of Environmental Hazards
- Your Earth-friendly Home Checklist
- Shift Toward Renewable and Zero Energy
- Site Choices that Make a Difference
- Using Suitable Green Materials
- Protecting Native Trees and the Ecosystem
- Reducing Waste
- Drain the Rain on the Plane
- Your Durable Home Checklist
- Long-lasting Materials and Equipment
- More Moisture Controls
- Dry Foundations
- Walls that Work in the South and Why
- Moisture Control: Roofing and Architectural Details
- Wind-resistant Walls
- Wind-resistant Roofs and Attachments
- Your Hazard-resistant Home Checklist
- Rising Above the Flood Risks
- Sewage Backflow Valves
- Flood Protection Design Features

- Flood-hardy homes: Wash-n-Wear instead of Gut-n-Replace
- What is a Wind Load?
- Consider Going Beyond the Minimum
- Design with Wind in Mind
- Storm Shelters and Storage
- Protect Windows and Doors to Protect Your Home
- Fire Protection Options
- Consider Hail and Freeze Hazards
- Preventing Dangerous Combustion Pollution
- Control Humidity to Control Mold, Dust Mites
- Clearing the Air for a Healthy Home

Other Partners: LaHouse contributors may be viewed at: http://www.lsuagcenter.com/en/family_home/home/la_house/sponsors_partners/contributors/.

The Road Home

(www.road2la.org)

Social Media Used: The Road Home website provides related news feeds at http://www.road2la.org/newsroom/default.htm. This page also provides links to latest statistics, public service announcements, and testimonials.

Specific Restoration and/or Nonstructural Mitigation Planning Proposals: The Road Home was part of the largest housing recovery program of its time in U.S. history (HUD, August 2007). It was designed to provide funding to eligible homeowners and renters whose primary residences were destroyed or severely damaged due to Hurricanes Katrina and/or Rita. Through the Road Home - Homeowner Assistance Program, almost 130,000 residents across the Louisiana coastal region received more than $8.9 billion to rebuild and protect their homes and rental properties from future storm damage. In addition to assistance for residential homeowners, the Road Home - Small Rental Property Program provided over $350 million for the restoration of over 8,000 rental units. The Road Home program is now concentrating on compliance and monitoring; a process in which homeowners show that all requirements of the federal grant process have been met.

Publications: The Road Home has limited resources available on their website.

Other Partners: The Department of Housing and Urban Development (CDBG funding source), Louisiana Office of Community Development and ICF International were part of the inception and management of the Road Home project. The Road Home website provides links to other organizations here: http://www.road2la.org/Default_ExternalLinks.aspx

The University of New Orleans Center for Hazards Assessment, Response and Technology (UNO-CHART)

(www.uno.edu/chart/)

Specific Proposals: UNO-CHART is an applied social science hazards research center at The University of New Orleans that collaborates with Louisiana communities including the City of New Orleans and its surrounding parishes. The objectives of UNO-CHART projects are to assist residents and local and state officials in reducing risk to natural hazards, especially hurricane and climate hazards, and to help them gain a better understanding of their risk and what they can do to protect themselves from these hazards.

Publications: See: http://www.uno.edu/chart/publications/index.aspx. Publications cover topics such as mitigation, reducing repetitive flood loss, coastal land loss and restoration, place attachment, impacts and lessons learned from Hurricane Katrina, evacuation, disaster-resistant universities, disaster recovery, and several others.

Other Partners: Project partners vary with each project.

Comments: UNO-CHART was founded in 2001 and is comprised of a multidisciplinary group of faculty, staff, and graduate research assistants representing various backgrounds including sociology, political science, public administration, planning, urban studies, anthropology, engineering and geography. Currently, UNO-CHART has projects that address repetitive flood loss, disaster mitigation planning, development of community resilience assessments, and scientist/community collaboration on ecosystem health, community continuity, executive level risk management, and risk literacy. Current projects are summarized at http://www.chart.uno.edu/projects/new-projects.aspx. The Center is continually applying for further funds for projects that address issues of disaster preparedness and recovery relating to the natural hazards that affect the state of Louisiana and the vulnerable coastal communities.

Appendix F

Alliances and Sponsors of Nonstructural Activities in Coastal Louisiana

RESTORE THE MISSISSIPPI RIVER DELTA
NATIONAL WILDLIFE FEDERATION

Hundreds of organizations are working to help coastal Louisiana residents and businesses adapt to changing environmental and land use conditions. The matrices that follow summarize the kind of support these organizations provide and the extent to which they work with similar organizations. This information is based on research performed as part of the National Wildlife Federation's Study in 2010 and 2011. See Appendices G and H for details on how this study was conducted.

The "Alliance Matrix" presented below documents partnerships among industry; local, state, and federal government entities; and non-governmental organizations. Over 500 organizations and their alliances with each other are listed. The matrix also describes the kind of support provided: financial, letter endorsement, active partnership, or documented link. The matrix shows that while organizations are beginning to form productive alliances to implement nonstructural measures, much potential in this arena remains untapped.

The second "Project and Sponsor Matrix" shows similar information through a slightly different lens. This Excel spreadsheet shows almost 550 organizations and the kinds of sponsorships they have attracted from a range of entities. As with the first matrix, the type of support is indicated. The Project and Sponsor matrix shows that organizations have not yet succeeded in taking full advantage of the attention and resources being focused on nonstructural measures in the Gulf of Mexico. This information supports the overall message of the National Wildlife Federation's study, which emphasized the importance of better leveraging resources to meet the individual needs of communities.

Appendix G

Research Conducted for This Study

Climate change is predicted to bring stronger hurricanes, rising seas, changing weather patterns, and other effects. These trends will put increasing pressure on south Louisiana, a region already facing crisis level wetland loss and subsidence rates. Levees and other structural measures that reduce flooding hazards offer one set of tools for meeting these challenges. Another set of tools, often called "nonstructural measures," can be equally important. Nonstructural measures include: flood prevention through land use planning, property protection through flood proofing and elevation, emergency services, and public information.

In 2010 and 2011, the National Wildlife Federation contracted with National Hazard Mitigation Association (NHMA) to study how nonstructural measures were viewed and being adopted in south Louisiana. This appendix describes methods used to gather this information, as well as summary results. See Appendix H for more detailed study results.

Methods

Interviews: The NHMA study team used a qualitative, standardized, open-ended interview approach to determine the attitudes, implementation, and current incentives and disincentives to employing nonstructural (also termed "mitigation") measures in coastal Louisiana. Before the interviews, the team developed an interview questionnaire specific to each stakeholder within the various communities across southern Louisiana. The team determined eight categories of stakeholders across five areas of costal Louisiana.

The Louisiana Coastal Master Plan divides coastal Louisiana into five districts. The team chose to sample two communities within each of the defined districts and eight stakeholders within each community in order to capture the breadth of statewide attitudes about nonstructural measures. In St. Bernard, Jefferson, Terrebonne, Lafourche, Plaquemines and New Orleans East, the team conducted 40 interviews with local citizens, local business leaders, government leaders, realtors, insurance agents, banks, contractors, non-profit development organizations, and community development foundations. To gather a national perspective, the team also conducted interviews with a national bank, contractor, and realtor.

In light of time constraints, the team gathered primary data from interviews conducted over the phone. During interviews, researchers took notes; recording devices were not used. The research team distilled these notes into primary themes organized both by stakeholder categories and by geographic area. This helped the team determine similarities and differences among groups.

The team also included participatory action 'interviews'[1] that were conducted by the Center for Hazard Assessment, Response and Technology (CHART) at the University of New Orleans, as well as comments from an Association of State Flood Plain Managers nonstructural mitigation conference, held in New Orleans. These comments were relevant because the conference included guided discussion among stakeholders from the state, local floodplain managers, engineers, universities, and research centers. Finally, the team considered extended interviews conducted by the local (Houma) TV station before, during, and after Tropical Storm Lee.

Data Gathering: In addition to the interviews, the NHMA team collected information specific to each of the 20 coastal parishes that made up the study area. This information included a review of readily available plans and Community Rating System data, as well as a review of each parish's website, news available on the website, and articles from online newspapers.

- Websites. An in-depth review of each parish's website indicated which topics and resources were available to residents. These resources could include the code of ordinance, flood/elevation maps, parish emergency plan for the parish, emergency alert information, storm preparedness education materials, and parish mitigation and/or comprehensive plans.
- Newspapers. The team searched each newspaper by the following keywords: elevation, floodproofing, evacuated, buy-out/acquisition, land-use planning, zoning, building codes, storm water management, drainage projects, and mitigation. Not all keywords yielded results. The query search was constrained within a one-year span: late August/early September 2010 through September 2011.

[1]The CHART activities include conversations with local stakeholders at various events such as continuity planning workshops around the state and the NOAA/CHART resilient Communities Project.

- Plans. Many parishes had a variety of plans available, including emergency plans, parish mitigation plans, evacuation plans, and comprehensive or master plans. Not all parishes had all plans, and not all plans available were listed on parish websites. More in-depth reviews of the mitigation and master plans dictated which plans mentioned hazards. Of the 20 targeted parishes, 11 parishes posted their comprehensive plans in final or draft form; seven parishes posted their emergency plans, three parishes posted their mitigation plans, although every parish is required to have one; and five parishes posted evacuation plans. These evacuation plans gave directions for leaving the parish; they did not explain how residents could create their own personal evacuation plans.

- Community Ratings System. Secondary data included recent state data (MS Excel sheet of LA CRS Communities, May 1, 2011) broken down by community. The Excel sheet contained points per activity and the total CRS credit, allowing the class to be determined. National Flood Insurance Program data from FEMA's Community Status Book Report for LA (2011) enabled the team to compare across the programs to see which coastal Louisiana communities within the targeted study area were participating in both the NFIP and CRS programs. National CRS scores were obtained through the NFIP/CRS January-April 2011 Update Newsletter. This information allowed the team to compare Louisiana communities to the national average.

Limitations: Obvious limitations included the size of the sample and the succinct nature of the interview questionnaire. The team's sample did not meet the standard criteria for a statistically significant research sample. Instead, the data gathered should be considered a snapshot of attitudes toward nonstructural mitigation in coastal Louisiana. The amount of time available to conduct interviews and general interviewee reluctance may also have contributed to the brevity of the data gathered through interviews. Because of the limited sample size, this data cannot be generalized to the population of coastal Louisiana as a whole.

Deciding which operational definitions of the keywords to choose when searching websites was another challenge. In some instances "flood proofing" and "retrofitting" were interchangeable. For the purposes of the news article review, these words were treated as separate terms. The same handling was used with the terms "stormwater management" and "drainage projects."

Some of the online newspapers included multiple parishes under in one paper. This could have led the study team to capture the same information multiple times or attribute parish information incorrectly.

Inconsistencies surfaced when conducting the newspaper search. Some online articles did not allow the reader to see more than a few lines without buying the full article. Other newspapers did not allow more than a seven day search or a two month search; others did not have an archives section. When these conditions were in place, the team's search was limited. Other papers did not have a search function. Researchers then scrolled through all articles from last twelve months to find relevant data.

Finally, in some cases, the plans were difficult to locate due to the variety of descriptive terms used as well as website navigation challenges. We noticed that some information could be found when using Google directly but could not be found when using the parish's own website's search and navigation functions. The team considered that a plan was officially posted only when it could be found through direct navigational access on the website.

Findings

Summary of Interview Findings: All of the interviewees claimed some knowledge about nonstructural measures (some claimed much greater knowledge) and could cite various examples of mitigation efforts. Most had some knowledge of various mitigation activities, opinions as to whom should be responsible for mitigation, the problems and obstacles facing mitigation efforts, and ideas about future mitigation should efforts. Most interviewees had some ideas about current mitigation incentives and disincentives.

- Mitigation knowledge. Most understood mitigation to be the processes that reduces the impact of hazards. With few exceptions, this understanding was limited to measures such as home elevation, various home or business hurricane protections, and levees. Mitigation professionals and some interviewees in the banking, development, and insurance industries understood the importance of land use management and code adoption and enforcement. However, those who supported these measures also understood that land use and codes are politically controversial in south Louisiana. Citizens, bankers, realtors, and insurance agents tended to focus their comments on large and costly mitigation projects, such as levees or elevation. Professional mitigation practitioners understood the importance of smaller activities such as cleaning the storm drain in front of one's home. Except for the professional mitigation practitioners, the majority of those interviewed thought of mitigation in terms of their recent hurricane experiences, with Hurricanes Katrina and Rita being the benchmarks. None of those interviewed mentioned mitigating environmental issues, such as global warming or wetlands loss. Issues of livelihood mitigation (protecting endangered traditional livelihood), ecological mitigation (protecting habitats), and environmentally friendly lifestyles were not mentioned by any of the interviewees.[2]

[2]This lack may be due the nature of the interview questions. But it also indicated that the general working definition of mitigation does not include large environmental, livelihood, cultural preservation, and lifestyle issues.

- Who should be responsible for mitigation? Governments (local, state, and federal) were considered key to mitigation. This responsibility included three forms: 1) government development and enforcement of codes; 2) development and funding for structural mitigation projects (levees); and 3) funding for individual home elevation. Bankers noted that few homeowners sought loans for mitigations projects. Mitigation professionals believed that governments must enforce codes, and that citizens must be more proactive in the support of land use planning and code enforcement. Mitigation professionals also believed that citizens must take more responsibility for mitigation of their own homes.

- Problems and obstacles. All of those interviewed viewed cost as the biggest obstacle to mitigation. This reflects the interviewees' focus on expensive projects, such as levees and home elevation. The lack of land use policies and codes was also mentioned. Mitigation professionals mentioned lack of citizen knowledge and commitment and a risk denying culture. Other obstacles cited by professional mitigation officers and NGOs were government red tape and conflicting levels of control (local, state, federal). Several NGOs cited obstacles with funders. All of the NGOs said that funders were in favor of mitigation, but the funders' narrow definition of rebuilding sometimes got in the way. Examples of this include funding only to rebuild as was, a lack of understanding of the community nature of mitigation, and the critical nature of livelihood mitigation for some community members.

- The shape of future mitigation. Those interviewed were asked to comment on what they hope future mitigation efforts would include. Everyone wanted to feel safer. Hopes for some included better levee systems, more home elevations, better codes and code enforcement, more government mitigation funding at all levels, more mitigation responsibility on the part of citizens and communities, and the development of a risk sensitive public.

- Mitigation incentives and disincentives. Interviewees said that funding was the major incentive for mitigation, influenced perhaps by the one time state/federal mitigation funding that south Louisiana received after the storms of 2005 and 2006. Interviewees also mentioned reduced insurance costs, as another incentive. On the flip side, interviewees mentioned few downsides to inaction. The team surmised several reasons for this. Code enforcement is not consistent, and many codes are at a minimum level, making non-compliance a low risk activity. If the area is near a levee, residents tend to feel safer, and development pressures increase. Storm history is often a disincentive as well, because people often either believe that "it will not happen again" or are in a state of denial.

Findings from NOAA/CHART: Material gathered from the NOAA/CHART Resilience Participatory Action Research Project added some important information to the interviews. The NOAA/CHART project was a multiyear collaborative project that examined a single coastal community that was dealing with high flooding risks. The NOAA/CHART research reached several conclusions relevant to the NHMA study.

- The community under study had a long history of mitigating against storms.
- The community was closely knit and had high degrees of cooperation among citizens.
- Governance was proactive, informal, and personal.
- Residents had a resiliency model of mitigation, meaning the ability to adapt to changing conditions. This could be understood as a capacity to bend[3]' rather than the usual model of 'springing or snapping back.' (Walker and Salt 2006).
- This community considered the environment, rather than their personal houses to be "home." Their value systems were focused on the community and the environment, not necessarily on personal property.
- Resident 'dwelled in place' rather than 'existing in space.' This created a very different relationship to their environment. (Relph1976, Malpas1999).

[3]Traditional and historical cultures along the Gulf Coast of Louisiana express a mitigation model of building 'soft', knowing that the storms will win. This contrasts to the more 'modern' scientific model of 'hardening,' which assumes that structures can be constructed so they will not be impacted by hazard events.

Other Findings: Comments from the Association of State Flood Plain Managers (ASFPM) National Floodproofing Conference IV (2008) and subsequent sessions at their national conferences discussed these issues as well. Their assessment of impediments to non-structural flood protection included the following: unclear definitions of structural and nonstructural measures, public perceptions, U.S. Army Corps of Engineers' actions and inactions, lack of communication about flood risk, and lack of education of local officials about mitigation programs. The role of nonstructural mitigation in levee safety and short/long-term reliance on levees highlights the need for awareness on several levels. The comments stated that increased education was needed about subsidence levels, mitigation options, and the benefits of adopting stronger local ordinances over and above FEMA minimum standards for development in levee-protected areas.

Summary of Major Themes: In summary, the interview process revealed several themes.

- Hazard awareness and mitigation knowledge among those interviewed was generally limited to particular hazards – particularly hurricanes.
- Mitigation projects were usually thought of as big and expensive. Those interviewed were mostly thinking of larger structural projects or home elevation and were unaware of other mitigation measures. The comments from the National ASFPM Conference also supported the notion that there is a strong focus on levees.
- Governments were seen as bearing the major responsibility for hazard awareness, policy, and funding. This was the case even among mitigation professionals who saw a clear role for government in enforcement and education, as well as the large structural projects. In general, community and household responsibility for mitigation was viewed as limited by those interviewed. However, the mitigation professionals interviewed expressed a desire to have homeowners and residents be more proactive and undertake minor mitigation measures on their own. The community in which CHART conducted interviews did have a history of hazard mitigation. In this, they appeared to be somewhat unique compared to the majority of other south coastal communities.

- Institutions that could have positive influences on mitigation activities (banks, realtors, insurance) did little to promote mitigation.
- In general, a culture of hazard mitigation has not been maintained, compared to historical levels of adaptation in south Louisiana. However, certain communities, particularly those with close ties to their land, do seem to have maintained a history of some forms of nonstructural mitigation. Historical perspectives can aid or hinder mitigation.
- In the same vein, people with strong roots in a particular place seemed more likely to take mitigation action. However, this type of action is particular to that community and may not be viewed as a standard mitigation measure by others.
- Complex, cumbersome, and contradictory policies make action difficult. The individuals interviewed expressed frustration about some of the policies and their implementation. This was echoed by attendees at the ASFPM conference.
- Hazard mitigation projects may increase risk and vulnerability for some individuals.
- Marginalized households and communities have a much more difficult time mitigating.
- Pressure on NGOs (and others) to quickly rebuild structures just as they were hinders mitigation.
- Except for structural mitigation projects, such as levees, mitigation professionals thought nonstructural measures could be handled by individual households. This contrasted with the prevailing view among interviewees that mitigation is a government responsibility.
- Livelihood, cultural, and ecosystem mitigation were not mentioned by those interviewed. Only the CHART interviews mentioned the environment as a significant factor.
- Few incentives for mitigation exist.

Appendix H

National Wildlife Federation Study Results

Appendix H-1

Data Collected from Parish Websites and Newspapers

RESTORE THE MISSISSIPPI RIVER DELTA
NATIONAL WILDLIFE FEDERATION

Table of Contents

Data Collection and Results: Parish Websites and Newspapers

Introduction: Climate change is predicted to bring stronger hurricanes, rising seas, changing weather patterns, and other effects. These trends will put increasing pressure on south Louisiana, a region already facing crisis level wetland loss and subsidence rates. Levees and other structural measures that reduce flooding hazards offer one set of tools for meeting these challenges. Another set of tools, often called "nonstructural measures," can be equally important. Nonstructural measures include: flood prevention through land use planning, property protection through flood proofing and elevation, emergency services, and public information.

In 2010 and 2011, the National Wildlife Federation contracted with National Hazard Mitigation Association (NHMA) to study how nonstructural measures were viewed and being adopted in south Louisiana. This appendix provides a summary of the secondary data reviewed as part of that study. The researcher browsed the 20 targeted parishes' websites and newspapers to determine how information about hazard preparedness, planning, and other disaster-related information was being shared. The results of this research are shown in the charts presented below.

Research Conducted: Google searches directed the researcher to each parish's home page. A more in-depth review of each site indicated which topics and resources were accessible, such as the code of ordinance, flood/elevation maps, emergency plans, emergency alert information, storm preparedness education materials, and mitigation and/or comprehensive plans. These elements are documented in a yes/no table with a check mark placed in the appropriate box, indicating the status of each element.

The researcher also attempted to capture what was being discussed in local news. This was done by browsing the news section of each website as well as each parish's newspaper(s) accessible online. The query search was limited to a one-year span, in this instance, late August/early September 2010 to September 2011, depending on the week that parish was researched. These were searched by keywords pertaining to nonstructural mitigation; specifically, elevation, floodproofing, evacuation, buy-out/acquisition, land-use planning, zoning, building codes, storm water management, drainage projects and mitigation. Not all of the keywords yielded results. The results that were found are presented in a table that shows how many articles came up per each keyword search, how many of those were relevant to nonstructural mitigation, major themes that surfaced, and specific notes about different articles. Each newspaper is shown in its own table.

Some inconsistencies surfaced when conducting the website news versus website newspaper search. Some online articles did not allow the researcher to see more than a few lines without buying the full article. Other newspapers did not allow more than a seven-day search or a two-month search, or did not have an archives section at all. The search was limited on these newspapers. Other papers did not have a search function; therefore, the researcher scrolled through each article from the last twelve months to find relevant data. It is possible that not all of the relevant articles were reviewed in these instances, as the title and first few lines may not have been indicative of a topic relevant to this research.

In addition to websites and local news, the 2008 state hazard mitigation plan's *Appendix E.21.4 Hazard Mitigation Project Types* was reviewed to

summary page. The table captures which types of mitigation measures or projects are mentioned from each data source. As the inquiry of each data source proceeded, the researcher populated an Excel sheet to document what was found. This information was then formatted into the charts below.

Findings: The research showed that most parishes make available on websites their code of ordinances and floodplain ordinances, emergency alert systems, maps, and storm preparedness materials. Very few parishes make some plans available, including emergency plans, mitigation plans, and evacuation plans. Comprehensive or master plans are readily available for about half of the study area, and many of them are currently being updated. Recent news articles show that the coastal parishes focused a great deal on structural mitigation, including infrastructure and drainage projects.

The types of nonstructural mitigation that surfaced as "hot topics" in the news articles included hurricane preparedness, flood maps, flood insurance, elevation, evacuation plans, and land-use planning or zoning that discourages development in hazard-prone areas. Very few articles mentioned floodproofing or voluntary buy-outs. When discussed, retrofitting and floodproofing were commonly referred to for commercial and/or public buildings as opposed to residential structures. The same is true for land acquisition. Land was mostly acquired for schools or airport space, rarely for green space. The types of nonstructural projects most noted in the hazard mitigation plan for the study area included public awareness, warning systems, building codes, zoning/land use planning, and acquisitions. Residents of the study area were recognized as resilient in several articles, and New Orleans has been distinguished as a model city for recovery. Research results showed that coastal Louisiana is actively working to inform their residents of nonstructural mitigation efforts. There is, however, considerable room for improvement (see Appendices A-2 and G).

Ascension Parish - Summary Page

Website: http://www.ascensionparish.net/
Website News: Same as online newspaper *Weekly Citizen*
Newspapers: *Donaldsonville Chief*
Weekly Citizen

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓			✓	✓			✓
No			✓	✓			✓	✓	

Website News: Same as online newspaper *Weekly Citizen*

Newspaper: *Donaldsonville Chief*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Elevation	2	1	elevation maps	Elevation data determines effects of water levels in parish. Purchase required in order to read entire article.
Floodproofing	0	0	n/a	n/a
Evacuation	11	4	evacuation routes; interactive learning; hurricane and flood preparedness	Elementary students are taught to plan for natural disasters through interactive learning. Have an evacuation plan to prepare for hurricane season and for Morganza flooding.
Acquisition	4	0	n/a	n/a
Land-use planning	2	1	Comprehensive Plan	Article argues that the Comprehensive Plan will destroy our culture.
Zoning and development	4	1	Parish politics	Three Planning and Zoning Committee members were replaced after supporting a new planning document that received overwhelming opposition from public.
Building Codes	1	0	n/a	n/a
Mitigation	1	0	n/a	Purchase required in order to read entire article.

Newspaper: *Weekly Citizen*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Website is identical to *Donaldsonville Chief* without an archives section to search.	n/a	1	lessons learned	FEMA changed its approach to handling disasters since Katrina and now has more authority to act prior to receiving a request from a governor. That translates into "not having to wait" until the impact of the storm is clear. "We have to act quickly and be prepared to support that," says Fugate.

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website	✓							Has form to inquire about your flood zone.
Newspaper	✓		✓		✓			Lessons learned.
Mitigation Plan					✓	✓		Structural Flood Control; Drainage; Planning/Studies; NFIP/CRS; Public Awareness; Generators

Assumption Parish-Summary Page

Website: http://assumptionla.com/
Website News: No website news
Newspaper: *Bayou Journal*

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes			✓	✓	✓	✓			
No	✓	✓					✓	✓	✓

Website News: None

Newspaper: *Bayou Journal*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Not searchable	n/a	n/a		Need to subscribe to paper to view; link does not work.

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website	✓							
Newspaper								
Mitigation Plan					✓	✓		Drainage; Planning/Studies; NFIP/CRS; Public Awareness; Warning Systems; Generators;
								Safe Rooms/Shelters

Calcasieu Parish-Summary Page

Website: http://www.cppj.net/
Website News: *Calcasieu Now*
Newspapers: *Lake Charles American Press*
Contraband
DeQuincy News
Sulphur Southwest Daily News
Times of Southwest Louisiana

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓	✓		✓	✓			✓
No				✓			✓	✓	

Website News: *Calcasieu Now*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Parish News	n/a	n/a	flood maps; emergency response; drainage improvements	New flood maps adopted. Residents can save money on flood insurance if purchased before maps go into effect. Calcasieu Awareness Emergency Response was designed for use during emergency events involving hazardous incidents. Hurricane Rita Block Grant Recovery funds allocated for parish drainage projects.

Newspaper: ***Lake Charles American Press***

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Not searchable	n/a	1	evacuation plan	Could only search headlines for previous seven days without buying subscription. One headline discussed the consolidation of the parish's 19 existing development codes into one document, including a Hurricane Watch 15-page PDF.

Newspaper: ***Contraband*** is McNeese University's official student newspaper. The link did not work.

Newspaper: ***DeQuincy News***

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Not searchable	n/a	n/a	n/a	Need to subscribe to paper to be able to view.

Newspaper: ***Sulphur Southwest Daily News***

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Search through Headlines	n/a	2	traveler information system; preparedness	The service allows callers to access up-to-date information about weather related road conditions, construction activities, and other critical incidents simply by dialing 511 from their telephone and saying the route or region about which they are seeking information. Pre-apply for benefits ahead of flooding in LA with the Disaster Supplemental Nutrition Assistance Program, the first year-round pre-application process in the nation.
Elevation	28	5	hurricane/flood preparedness; non-residential floodproofing; flood insurance; safer residential building	Elevation and flooding to be discussed at hurricane season briefing; LSUAgCenter provides online flood-preparation information; improvements to any business, commercial, or non-residential building should be elevated above base floor and dry floodproofed; purchasing flood insurance before new flood maps are released could save you money; LSUAgCenter's LaHouse has exhibits and information to inform homeowners how to build more resilient, targeting flood and wind-resistant buildings.
Floodproofing	1	n/a		Need to subscribe to read entire article.
Evacuation	13	7	evacuation; emergency alert system; hurricane preparedness; flood insurance	Lessons learned from Katrina encourage mandatory evacuation for N. Carolina to New England for Hurricane Irene; Community Information Service can alert citizens to evacuate; residents encouraged to have an emergency or hurricane plan in place before hurricane season begins; FEMA urges residents to prepare for possible Morganza flooding by purchasing flood insurance.

Acquisition	18	0	n/a	n/a
Land-use planning	18	1	residents meet to discuss master plan	Issues include subdivision regulations, sewage improvements, land use, historic preservation, and parks and recreation.
Zoning and development	29	1	public meetings	Three separate public meetings to review Unified Development Plan. The UDP was created for the purpose of consolidating numerous previously adopted ordinances associated with items such as zoning and subdivisions.
Building Codes	46	4	possible hurricane damage; public hearing on permits moratorium; public resources; historic district preserved	Possible Hurricane Irene damage to structures on the east coast; moratorium on any permits for the demolition, moving, remodeling, reconstruction of any building or structure in a certain designated area in the City of Sulphur; City donated building code books to Sulphur Library so that contractors and residents can do research before building or renovating; prohibition of reconstruction in historic district.
Mitigation	13	3	public facility retrofitted; mitigation professionals learn together; mitigation funding	FEMA and HUD funds help strengthen hospital facility; International Disaster Conference and Expo announced to educate on mitigation but to those already in the field; disaster management and homeland security professionals from all aspects of the industry can share information about mitigation capabilities/challenges; tens of thousands of homeowners will be able to mitigate their homes with $100 million of federal funding.

Newspaper: ***Times of Southwest Louisiana***'s website is under construction.

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website	✓							Form to report flood damage; emergency situations tab that lists hazards & information on how
								to prepare for each.
Newspaper	✓	✓	✓		✓	✓		Flood insurance; Retrofitting; professional development
Mitigation Plan					✓			Retrofitting; planning/studies; NFIP/CRS; public awareness

Cameron Parish-Summary Page

Website: http://www.parishofcameron.net/
Website News: *News and Resources*
Newspaper: *Cameron Parish Pilot*

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓		✓		✓			✓
No			✓		✓		✓	✓	

Website News: *News and Resources*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Not searchable	n/a	n/a	emergency alert system; retrofitting	Residents encouraged to sign up; HMGP program can provide up to $7,500 for individual mitigation measures as Hurricane Rita aid.

Newspaper: *Cameron Parish Pilot*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Not searchable	n/a	n/a		Published once a week.
			Bldg codes; evacuation; restoration; preparedness	LSU AgCenter builds model house to code and elevated; road resurfaced to serve as hurricane evacuation route; many responded to evacuation call; $402,000 for marsh restoration; have a plan.

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website								Alert system; retrofitting; sign up for emergency notifications.
Newspaper			✓			✓		Preparedness; restoration
Mitigation Plan					✓			Retrofitting; planning/studies; NFIP/CRS; public awareness

Iberia Parish-Summary Page

Website: http://www.iberiaparishgovernment.com/
Website News: *Parish News*
Newspaper: *Daily Iberian*

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes				✓	✓	✓			
No	✓	✓	✓				✓	✓	✓

Website News: *Parish News*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Not searchable	n/a	4	flood protection; elevation; flood maps	Sandbags are available for Tropical Storm Lee; Gustav/Ike Elevation Program Outreach office open to assist with elevation funding; new map showing the expected flooding from the Mississippi River flooding;maps available for public viewing.

Newspaper: *Daily Iberian*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
All searched	0	0	n/a	Archives do not yield any articles from the previous year using the main keywords.

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website	✓	✓						Promote elevation; flood maps; sign up for emergency notifications.
Newspaper	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mitigation Plan	✓	✓		✓	✓		✓	Structural Flood Control; public awareness; warning systems; generators

Iberville Parish-Summary Page

Website: http://www.ibervilleparish.com/
Website News: *News from Iberville Parish*
Newspaper: *Post South*

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓	✓	✓		✓	✓	✓	
No					✓				✓

Website News: *News from Iberville Parish*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
No way to search specifics	n/a	1	flood protection	Sand-bagging machine that produces 25 to 30 sandbags per minute to protect homes from Morganza flooding.

Newspaper: *Post South*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Archives	102	1	n/a	No relevant articles were found.

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website	✓	✓						Promote elevation
Newspaper	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mitigation Plan						✓	✓	Structural flood control; retrofitting; planning/studies; NFIP/CRS; public awareness

Jefferson Parish-Summary Page

Website: http://www.jeffparish.net/index.cfm
Website News: *Latest News Release*
Newspapers: *Daily Journal of Commerce*
Kenner Star

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓	✓	✓	✓	✓		✓	✓
No							✓		

Website News: *Latest News Release*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Not searchable by keyword	170	15	preparedness; evacuation; failed levee rescued; retrofitting; drainage; BP tourism funds; public awareness; restoration	Tropical Storm Lee caused flooding and evacuation in some communities. Failed levee rescued; pump stations operated; trainings for shelter volunteers to respond to animals; hardened safe rooms; residents asked to clear debris from storm drains; drainage improvements funded; parish awarded tourism mitigation funds to revive tourism since BP spill; parish EOC highlight retrofitting techniques; parish hosts hurricane preparedness pep rally; asking for relocation costs due to SELA drainage projects; Christmas tree project to rebuild marsh; Save the Bayou Festival.

Newspaper: *Daily Journal of Commerce*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Not relevant	n/a	n/a	n/a	Nothing on mitigation; all business.

Newspaper: ***Kenner Star***

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Searched by month	n/a			Kenner's free monthly community newspaper
Elevation		12	elevation money; mitigation money; commercial floodproofing	Grant money still available up to $160,000; residents may be eligible for $7,500 worth of free Shutters, and $100,000 for home elevations, if received letter; FEMA funds helped repair Laketown Pier
Floodproofing		0	n/a	n/a
Evacuation		8	preparedness; evacuation route; have a plan	Local business offering *Evacuation Bucks* as discounts on tires; evacuation plans sufficiently maintained; emergency housing unit constructed; evacuate with medications; Latin Americans encouraged to evacuate; create or update business continuity plans; protect your furniture with cinder blocks.
Acquisition		0	n/a	n/a
Land-use planning		0	n/a	n/a
Zoning and development		5	zoning ordinance update; blight; funding	Updated included the city's hazard risk areas, land development codes; three blighted dwellings found; buyout for commercial use; grants received to update zoning ordinance
Building Codes		0	n/a	n/a
Mitigation		1	elevation funding	Repeat article from “elevation” slot

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website			✓				✓	Preparedness; retrofitting; failed levee rescued; BP tourism funds; public awareness; restoration; sign up for emergency notifications.
Newspaper	✓	✓	✓		✓			Blight
Mitigation Plan	✓	✓			✓	✓	✓	Structural flood control; NFIP/CRS; public awareness; generators; safe rooms/shelters

Lafourche Parish-Summary Page

Website: http://www.lafourchegov.org/
Website News: *News Items*
Newspapers: *Daily Comet*
Nicholls Worth

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓	✓	✓	✓	✓	✓		✓
No								✓	

Website News: *News Items*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Not searchable by keyword	n/a	n/a	evacuation; flood protection; flood maps; master plan; safe EOC trailers; drainage; NFIP rates; restoration; recovery money	Tropical Storm Lee reactions—sandbags, pump stations going; review of flood maps revealed convoluted flood zones; special needs encouraged to register for evacuation assistance; public input for master plan; parish received two emergency trailer units to hold emergency personnel during a Cat 5 Hurricane; flooding concern from Morganza; Gustav-Ike disaster recovery funding pays for drainage improvements; levees affect NFIP Rates; Terrebonne Parish able to provide restoration recommendations; Road Home properties auctioned off—funds will go to future parish projects.

Newspaper: *Daily Comet*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Elevation	387	73	elevation and drainage projects worked (possible w FEMA funds);	Terrebonne Parish has elevated in excess of 500 to 1,000 homes and demolished more than 700 reploss (Repetitive Flood Loss) homes and buildings; residents prepare for Morganza flooding; locals lack flood insurance; plans to rebuild and re-enforce current levees;
			retrofitting; flood preparedness; levee construction; hurricane preparedness; insurance encouraged; flood maps; restoration; commercial construction affects drainage	Corps plan to build twin bridges at Falgout Canal and a lock levee as well to protect area and return saltwater flow to marsh; commercial developments cause residential flooding.
Floodproofing	1	1	FEMA funds home elevation	FEMA provides financial aid to elevate over 45 homes in area.
Evacuation	203	24	emergency alerts; evacuation encouraged; levees worked; hurricane preparedness	Tropical Storm Lee preparations; hurricane season begins; Greater Lafourche Port Commission's annual hurricane readiness meeting; Morganza flooding preparedness.
Acquisition	45	0	n/a	n/a
Land-use planning	62	16	restoration; fisherman aid at bottom of list; master plan meetings; buy-outs for green space; BP funds	A cold-storage facility to aid fishermen in case of hurricane, may not come to pass due to financial restrictions; 48 properties brought by the state road home program to be zoned for low to moderate income properties and green space; BP money allocations under careful consideration.

Zoning and development	252	4	elevated homes avoided flood; zoning change allows businesses to rebuild; restoration	Low-lying area residents did not flood for Tropical Storm Lee thanks to their elevated houses; council approves zoning changes that would allow business to rebuild even if they were grandfathered as business in residential zone; coastal zone scientifically evaluated.
Building Codes	0	0	n/a	n/a
Stormwater	155	4	restoration;	Coastal restoration project receives $60 million; scientist remarks
Management			flood control questioned; elevation; flood control structure built based on Netherlands	that by not allowing Mississippi flooding we're losing valuable silt that created barrier islands; state mitigation money to pay for 2nd round of recovery projects like elevation; levee director states, "We are building a flood-control system that protects the wetlands rather the drains them, following a trip to the Netherlands where he studied their extensive drainage systems, locks and bridges.
Drainage projects	177	12	levee protection; drainage improvements underway; public awareness; construction increases drainage problems	Warning of drainage overflow from Tropical Storm Lee; parishes linking levees for improved safety; parish is in a drainage overhaul with road projects, culvert replacements and three new pump stations; Terrebonne Parish officials sent out reports to local mailboxes last week, as part of a new policy to update residents annually on drainage, road and levee work; the extensive development on Martin Luther King Boulevard has brought expanses of concrete and construction, meaning more water overloads drainage ditches instead of being absorbed into the ground.
Mitigation	60	4	BP funds not readily available; elevation costs; mitigation projects	It costs millions of dollars to raise homes; mitigation taking place as a result of past storms.

Newspaper: *Nicholls Worth*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
No archives	n/a	n/a	Hurricane Plan	Official paper of Nicholls State University; announcement of plan available online

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website		✓	✓				✓	Flood protection; flood maps; master plan; Safe EOC trailers; NFIP rates; restoration; recovery money; sign up for emergency notifications.

Newspaper	✓		✓	✓ (green space)	✓ (for businesses)		✓	Retrofitting; flood and hurricane preparedness; levee construction; flood maps; restoration; emergency alerts; levees worked; master plan meetings; BP funds; flood control structure built based on Netherlands; public awareness; Mitigation projects in response to past storms
Mitigation Plan				✓	✓	✓	✓	Retrofitting; public awareness; warning systems

Livingston Parish-Summary Page

Website: http://www.livingstonparishla.gov/default.aspx
Website News: *News*
Newspapers: *Gazette*
Livingston Parish News

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓		✓		✓			
No			✓		✓		✓	✓	✓

Website News: *News*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Not searchable by keywords	n/a	2	development limited; comprehensive plan input	Purpose is to protect the parish's developed area from storm surge by preserving natural wetland buffer areas, to conserve sensitive marshlands by limiting any harmful development, and to encourage managed recreational activities within these areas.

Newspaper: *Gazette*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Not searchable	n/a	n/a	n/a	Website not up-to-date, can only search July 2011; nothing related found.

Newspaper: ***Livingston Parish News***

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Elevation	13	5	signage poses threat; mitigation	The ordinance allows city officials to deal with old signs that present electrical safety concerns or create hazards in high winds; mitigation
			plan offers solutions; elevate land and improve drainage canals for grocery store property	plan includes drainage projects and repetitive loss solutions.
Floodproofing	0	0	n/a	n/a
Evacuation	9	2	hurricane conference; DOTD studies widening highway	National Hurricane conference participants are having the right conversations; widening major highway can be helpful in evacuation situations, among other situations.
Acquisition	14	3	drainage project; new courthouse	Land acquisition for new courthouse; diversion canal is one of many projects on the ballot; because the Comite River is a tributary of the Amite River, Livingston Parish residents will receive flood control benefits from the project.
Land-use planning	9	2	Master Plan meeting	Residents are urged to provide input on master plan.
Zoning	43	9	zoning ordinance more complete; house demolition; ordinance demands demolition of commercial building; flood insurance; HUD meeting draws crowd	Floodplain management grant approved to allow updated subdivision regulations; Livingston prepares to enact zoning ordinance; demolition costs are affordable but debris pickup is not; residents can participate in master plan online; regulating flood insurance in regard to recovery funds; 1,000 residents turn out for $300,000 HUD grant application discussion.

Stormwater management	1	1	apartment complex protested for drainage concerns	Residents protest apartment plans—McLin and Associates did a drainage impact study, and a stormwater retention pond on the property would have reduced runoff.
Drainage projects	45	13	Gustav debris removal program problematic; flood protection; drainage projects;	Confusion around debris removal from canal/drainage sites; parish adopts updated mitigation plan
			new plan adopted	
Mitigation	19	6	drainage concern from debris; BP forced to pay for restoration	Debris removal project halt puts area in danger of flooding; concern about mitigation costs stalls other drainage work; concern for wetlands mitigation costs, senators force BP to pay for coastal restoration

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website					✓			Sign up for emergency notifications.
Newspaper	✓				✓	✓	✓	Flood insurance; restoration
Mitigation Plan				✓	✓	✓	✓	Retrofitting; public awareness; warning systems

Orleans Parish-Summary Page

Website: http://www.nola.gov/

Website News: *City of New Orleans: All Releases*
Newspapers: *Times-Picayune*
Clarion Herald
Courtbouillon (Dillard University Newspaper; searched all keywords, all entries date from more than a year ago)
Gambit Weekly (weekly news on entertainment in New Orleans)
Louisiana Weekly (Multicultural News Media)
Maroon (Loyola University Newspaper)
New Orleans City Business

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓		✓	✓	✓		✓	✓
No			✓				✓		

Website News: *City of New Orleans: All Releases*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Not searchable by year	n/a	3	residents are resilient; coastal restoration is critical to future of LA; speed in recovery projects	New Orleans is poised to be the city that defines 21st century America, Mayor Landrieu notes. "We are rebuilding from the ground up and attempting to set the standard for true community renewal in America. We are, in fact, the most immediate laboratory for innovation and change and our success or failure will be the symbol for America's ability to accomplish great things, or not."; Recovery projects to be completed expeditiously

Newspaper: *Times-Picayune*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Elevation	20	8	sharing best practices; flood protection; safety; drainage needs improvement; comment on exclusiveness of mitigation program	Katrina victims can provide guidelines to Hurricane Irene victims; Road Home not well managed; home collapses during elevation and kills worker; 8th graders do field research, including capturing land elevation; rainstorm cause flooded houses; "We have found that any neighborhood, whether prone to flooding or not, can flood if one of the levees breaks." "Why can't everyone in the New Orleans area be prevented from suffering as much wind damage in the future?"
Floodproofing	0	0	n/a	n/a
Evacuation	63	2	preparedness	Mayor Landrieu warns residents of upcoming hurricane season; Hurricane guide is available at the Jefferson Parish library.
Acquisition	0	0	n/a	n/a
Land-use planning	27	8	BP coastal restoration; place attachment, flood control structure	"This is the next step they can take to help us to restore our coast and truly show they are serious and they are committed about making it right and beginning to restore some of the damage along our coast." Residents react to salt water diversion plan. Louisiana projections show Morganza Floodway opening would threaten more than a dozen communities. State to create oyster advisory committee in wake of Gulf oil spill.
Land Zoning	1	1	sea level rise	Flood predictions bring on encouragement to build with sea level rise in mind.
Drainage projects	9	4	BP coastal restoration; place attachment, flood control structure	Louisiana to create oyster advisory committee in wake of Gulf oil spill. Flood predictions bring encouragement to build with sea level rise in mind. St. Tammany Parish community meeting to discuss rezoning and drainage issues.
Mitigation	45	12	plans reviewed	Hurricane Recovery committee discusses HMGP and Road Home program. BP fund rebuilding Chandeleur islands as mitigation.

Newspaper: ***Clarion Herald***

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Elevation	1	0		
Floodproofing	n/a	n/a	n/a	n/a
Evacuation	1	1	evacuation shelter is ready year-round	Former Winn-Dixie to serve as year-round evacuation center.
Acquisition	n/a	n/a	n/a	n/a
Land-use planning	n/a	n/a	n/a	n/a
Zoning and development	n/a	n/a	n/a	n/a
Building Codes	0	0	non-residential	Mitigation incorporated in church renovations.
Mitigation	n/a	n/a	n/a	n/a

Newspaper: ***Louisiana Weekly (Multicultural News Media)***

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Elevation	3	2	mitigation funding not secure; restoration	Resident asked to return Road Home money. Website not accurate for applicants to check their status. Those who were eligible are now told they're not. Sediment from floods helps to rebuild lost land in some areas.
Floodproofing	0	0	n/a	n/a
Evacuation	6	3	critical care facility not prepared; relocation	Lawsuit against hospital owners for not preparing the hospital and its patients for Hurricane Katrina. The job market has shifted out of the evacuation zone.
Buy-outs	1	1	commercial buyout	Properties rezoned after buyout for airport.

Acquisition	5	1	master plan	Master plan amendments include land acquisition for school.
Land-use planning	0	0	n/a	n/a
Land Zoning	4	1	zoning change benefits recovery of neighborhood	A zoning change for the Tremé area allows limited commercial uses in residentially zoned buildings that have historically been used for commercial uses. This could give new life to communities by bringing back neighborhood friendly shops of the past, such as bakeries and grocery stores.
Building Codes	1	1	mitigation funds	Racial discrimination challenge settled as more funds aid more than
				1,300 homeowners with adequate compensation.
Drainage projects	1	1	drainage projects	Pervious concrete, a porous material with an underlying layer that captures water and oily contaminants, reduces strain on drainage mechanisms.
Mitigation	2	1	green industry meets safe building	For some, the flooding associated with Hurricane Katrina represented an opportunity to rebuild smarter. Mason believes that green practices represent an opportunity for New Orleanians.

Newspaper: ***New Orleans City Business***

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Elevation	12	6	HMGP funding questioned; levee protection; advisory elevation standards	Audit findings are addressed by Paul Rainwater, Commissioner of Administration for LA. State defends its performance. Website tracking Road Home progress. Increase in elevation costs decreased number of eligible participants. Flood protection improvements increase New Orleans's protection from future hurricanes. Fund distribution questioned. Flood elevation standards questioned as advisory elevations will be moot when new DFIRMS are released in the coming year.
Floodproofing	0	0	n/a	n/a
Evacuation	15	3	evacuation of oil rigs and St. Landry Parish	Oil rigs in the gulf have been evacuated as Tropical Storm Lee moves in. A mandatory evacuation order was lifted for St. Landry Parish. New forecasts show no extensive damage done by Miss River flooding. Airport was operational for medical evacuations and responders.
Land Acquisition	6	2	residential and school acquisitions	Holy Cross needs to acquire school to complete development. Property acquired for VA hospital.
Land-use planning	4	2	elevation of critical care facility; New Orleans is model for recovery	New VA hospital will be elevated to avoid floodwaters but destroys historic neighborhood. Mayor of Detroit looks to New Orleans recovery for direction in revamping his neighborhoods.
Land Zoning	15	1	zoning changes ease development	"Zoning laws have since been changed," parish planning director Sidney Fontenot says, "and the changes made to the code from 2007 to 2009 make development in the parish easier."

Stormwater	8	2	drainage issues; plan to use stormwater wisely	Rain runoff and flooding has the potential to wash hazardous materials and other building components into the storm drainage system, and an effort is under way to combat the problem. The goals of the plan will be to reduce flood hazards, use storm water as a resource, better manage groundwater and minimize soil subsidence.
Drainage projects	29	2	funds allocated for drainage projects	Sewerage and Water Board infrastructure is one of the biggest challenges facing the city and Mayor Landrieu said a new “one bite at a time” approach has yielded an additional $16 million from FEMA. The U.S. Army Corps of Engineers has awarded a $13.6 million contract to improve drainage along two canals on the west bank of Jefferson Parish.
Mitigation	11	5	mitigation funds poorly managed; flood-prone homes improved or rebuilt with help of funds; restoration	The govenor’s financial chief acknowledged today that a $750 million Louisiana hurricane recovery program that provides money for home elevations was “poorly run” when it began. An estimated 20,000 flood-prone homes are expected to receive improvements under the Hazard Mitigation Grant Program. The state says there have been more than 128,000 grants to Road Home applicants, including more than 117,000 who chose to rebuild their homes. Lawmakers question state about home hazard funds, asking if the money is reaching the right people. The Old River Mitigation Bank project would use dredged material to restore marsh that was destroyed by saltwater intrusion.

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website								Residents resilient; coastal restoration is critical to future; speed in recovery projects; sign up for emergency notifications.
Newspaper	✓		✓	✓ (resident-ial and comercial)	✓		✓	Sharing best practices; flood protection; safety; exclusiveness of HMGP program; BP coastal restoration; place attachment; flood control structure; mitigation funding not secure/ questioned; relocation; master plan; green meets safe building; levee protection; N.O. is model for recovery; flood-prone homes improved or rebuilt

Mitigation Plan	✓	✓				✓	✓	Structural flood control;
								planning/studies; public awareness; generators; safe rooms/shelters; relocation; wetland preservation

Plaquemines Parish-Summary Page

Website: http://www.plaqueminesparish.com/
Website News: *Plaquemines Parish News*
Newspaper: *Plaquemines Gazette*

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓		✓	✓	✓			
No			✓				✓	✓	✓

Website News: *Plaquemines Parish News*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Limited use search engine.	3	1	restoration of barrier islands	The Plaquemines Parish plan to lower storm surge to the entire Parish could soon become a reality. Rebuilding the deteriorated barrier islands to prevent oil from intruding into the wetlands.

Newspaper: *Plaquemines Gazette*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Elevation	5	4	levee improvements; flood maps; levee effect; structural mitigation; restoration	Flood maps are more inclusive of flood control structures. A representative of the Myrtle Grove Homeowners Association raised his concerns about the 300 homes behind the levee currently being built by Army Corps. The 25 miles of levees, floodwalls, a gate, and pumping stations along the Harvey and Algiers canals reduce flood risk to West Bank. Restoration projects benefit flood protection too.

Floodproofing	0	0	n/a	n/a
Evacuation	0	0	n/a	n/a
Acquisition	0	0	n/a	n/a
Land-use planning	0	0	n/a	n/a
Zoning and development	11	2	zoning discussion; drainage concern	The Plaquemines Parish Council met on May 12, discussing several ordinances and resolutions surrounding the rising Mississippi River, as well as ongoing issues over zoning in Myrtle Grove. Drainage problem brought attention to fact that pump station is not positioned as it should be.
Building Codes	0	0	n/a	n/a
Stormwater management	0	0	n/a	n/a
Drainage projects	0	0	n/a	n/a
Mitigation	0	0	n/a	n/a

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website								Coastal restoration; sign up for emergency notifications.
Newspaper					✓		✓	Levee improvement; flood maps; levee effect; structural flood control; restoration
Mitigation Plan	✓			✓	✓	✓	✓	Public awareness; warning systems

St. Bernard Parish-Summary Page

Website: http://www.sbpg.net/
Website News: *Local News from St. Bernard Parish*
Newspaper: *St. Bernard Voice*

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓		✓		✓			
No			✓		✓		✓	✓	✓

Website News: *Local News from St. Bernard Parish*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Not searchable by keyword	n/a	26	recovery; levee and drainage improvements; flooding; preparedness; structural mitigation; reconstruction of fire station; emergency alerts; evacuation assistance; restoration; residential acquisition; rebuilding volunteers; art center rehabilitated;	Flooding caused by Tropical Storm Lee. Replacing this structure with a bridge was a smart project to help mitigate future damages in the area by improving the canal crossing and the area's drainage. The fire station structure is designed to withstand 130 mph wind gusts. Recovery of strip mall moving forward. New commercial construction—built elevated. The parish used federal Hazard Mitigation grant funds to buy the properties to turn them into permanent green space. President Taffaro was a strong voice among regional leaders addressing the BP oil spill in efforts to protect and to restore critical fisheries and marshlands and get appropriate funding and support from BP and the government.
			oil spill	

Newspaper: ***St. Bernard Voice***

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Elevation	1	1	levee improvement	Second 7.5 mile stretch of floodwall can now defend against a 100 year storm.
Floodproofing	0	0	n/a	n/a
Evacuation	0	0	n/a	n/a
Acquisition	2	2	land acquired for school; restoration	Freshwater diversion shot down by community.
Land-use planning	0	0	n/a	n/a
Zoning and development	8	1	zoning ignored	Apartment complexes defy current zoning ordinance.
Drainage Projects	6	1	improve drainage	The parish will begin removing slabs from private property with the use of a $10,000 grant from the Office of Community Development (OCD). Funding will also include filling, grading, sloping and compaction of low areas to improve drainage.
Mitigation	1	1	reconstruction school	Katrina-damaged school celebrates grand opening of remodel.

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website			✓	✓		✓ (public facility)	✓	Recovery; flooding; structural mitigation; emergency alerts; restoration; rebuilding volunteers; oil spill; sign up for
								emergency notifications.
Newspaper				✓ (land for school)	✓	✓ (school)	✓	Levee improvement; restoration
Mitigation Plan				✓	✓	✓	✓	Retrofitting; public awareness; warning systems

St. Charles Parish-Summary Page

Website: http://www.stcharlesgov.net/
Website News: *News*
Newspaper: *St. Charles Herald Guide*

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓		✓	✓	✓			✓
No			✓				✓	✓	

Website News: *News*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Not searchable by keyword	n/a	30	FEMA funds for Spillway flooding; drainage improvements; levee construction; parishes working together in mitigation; hurricane preparedness; CDBG funds used; restoration; comprehensive plan	Need to subscribe to paper to view. Declaration releases money to repair Bonnet Carre Spillway Road. "Even though no homes flooded, we still had a flood event here that damaged parish infrastructure. The funds will help us adequately deal with this somewhat unexpected expense." During the flood situation we lent some flood tubes to Terrebonne Parish, and they sent me a letter today thanking us for the gesture. Community Development Block Grant funds used for infrastructure. Berm levee is raised. Comprehensive plan top priority is flooding and hurricane protection.

Newspaper: ***St. Charles Herald Guide***

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Elevation	6	4	twice victim; evacuation plan; structural/drainage improvements	Victims of storm are also victims of fraudulent contractors. To help Louisianans get ready for hurricanes, the state has launched a game plan application for cell phones and computers. New culverts installed.
Floodproofing	0	0	n/a	n/a
Evacuation	8	3	hurricane preparedness	Create plan, practice plan; make use of social media; LSU AgCenter offers educational materials.
Acquisition	4	1	levee improvement	Levee improvements approved, but progress is slow/underfunded.
Land-use planning	0	0	n/a	n/a
Zoning and development	8	1	zoning info accessible	Parish receives top-rated website award (only parish in LA to do so). Grading takes into account the proactive disclosure of information regarding budgets, meetings, elected and administrative officials, permits and zoning, audits, contracts, lobbying, public records and taxes, as well as ease of use and availability of information.
Building Codes	0	0	n/a	n/a
Stormwater management	0	0	n/a	n/a
Drainage projects	0	0	n/a	n/a
Mitigation	12	8	drainage improvements; non-residential floodproofing; structural mitigation; wetland mitigation	Recent rain events prove that improvements worked; stronger building practices make courthouse safer; levee construction

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website							✓	FEMA funds for spillway flooding;
								levee construction; parishes working together in mitigation; hurricane preparedness; CDBG funds used; restoration; comprehensive plan; sign up for emergency notifications.
Newspaper		✓ (resident-ial and non)	✓		✓		✓	Twice victim; levee improvement; hurricane preparedness; structural/wetland mitigation
Mitigation Plan	✓			✓	✓	✓		Retrofitting; public awareness; warning systems

St. James Parish-Summary Page

Website: http://www.stjamesla.com/
Website News: *Press Releases*
Newspaper: L'Observateur (see St. John the Baptist Parish as this paper serves multiple parishes)

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓		✓	✓	✓			✓
No			✓				✓	✓	

Website News: *Press Releases*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
No articles, just press releases	n/a	2	levee protection with sandbags	St. James Parish to support levee district in preparation for Morganza flooding. At this time, residential homes and businesses throughout the parish are not in jeopardy of flooding. Parish officials are working diligently ...to ensure the safety of our residents.

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website								Levee protection; flood zones
Newspaper	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mitigation Plan				✓	✓	✓	✓	Retrofitting; public awareness; warning systems

St. John Parish-Summary Page

Website: http://www.sjbparish.com/
Website News: St. John Parish News Releases
Newspaper: L'Observateur

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓	✓	✓	✓	✓			✓
No							✓	✓	

Website News: St. John Parish News Releases

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Can't search by keyword	n/a	8	preparedness; funds available to mitigate; drainage improvements; hazard mitigation plan; emergency alerts	Develop emergency plans; Gustav/Ike damaged homes funded for repairs; culverts replaced; parish hazard mitigation plan finalized.

Newspaper: L'Observateur

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Elevation	28	4	preparedness; drainage projects	Drainage improvements include culverts, pump stations, clearing debris from drains.
Evacuation	21	7	hurricane preparedness; Morganza flood help; evacuation; drainage improvements	Entergy has text-based services now for times of emergency or evacuation. Hurricane plans are encouraged. “To go” bags given to elderly.
Acquisition	5	0	n/a	n/a
Land-use planning	16	3	public facility built strong; wetlands education; protective infrastructure	Sheriff’s office new facility designed to withstand a moderate Cat 3 hurricane. In St. Charles Parish, Wetland Watchers Celebration teaches over 800 5th graders about the coast and wetlands.
Zoning and development	19	2	zoning and drainage improvement	Three new pumping stations aid residential flooding. Land use plan created.
Building Codes	6	2	Katrina blight	Demolition of blight.

Mitigation	10	7	wetland and levee protection; drainage improvements; wetlands restoration; residential mitigation help; evacuation; drainage improvements	The Housing Mitigation program will assist low-income families in making roof, window, and door replacement repairs to owner-occupied homes damaged by Hurricanes Gustav and Ike in 2008. Approval awarded for levee protection. Funds approved for wetlands mitigation. New bar screen cleaner and deck remove trash and green debris from the pump's intake.
Acquisition	5	0	n/a	n/a
Land-use planning	16	3	public facility built strong; wetlands education; protective infrastructure	Sheriff's office new facility designed to withstand a moderate Cat 3 hurricane. In St. Charles Parish, Wetland Watchers Celebration teaches over 800 5th graders about the coast and wetlands.
Zoning and development	19	2	zoning and drainage improvement	Three new pumping stations aid residential flooding. Land use plan created.
Building Codes	6	2	Katrina blight	Demolition of blight.
Mitigation	10	7	wetland and levee protection; drainage improvements; wetlands restoration; residential mitigation	The Housing Mitigation program will assist low-income families in making roof, window, and door replacement repairs to owner-occupied homes damaged by Hurricanes Gustav and Ike in 2008. Approval awarded for levee protection. Funds approved for wetlands mitigation. New bar screen cleaner and deck remove trash and green debris from the pump's intake.

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website		✓					✓	Emergency alerts; mitigation funds; sign up for emergency notifications.
Newspaper			✓		✓		✓	Preparedness; retrofitting; residential
								mitigation; wetlands restoration
Mitigation Plan				✓	✓	✓	✓	Retrofitting; public awareness; warning systems

St. Martin Parish-Summary Page

Website: http://www.stmartinparish-la.org/
Website News: No separate news section. There is a direct link to *Teche News*.
Newspaper: *Teche News*

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓			✓			✓	
No			✓	✓		✓	✓		✓

Newspaper: *Teche News*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Elevation	29	9	drainage/residential improvements; Morganza flooding, evacuation; construction code adopted; flood ordinance in effect; DFIRMS affect NFIP premiums	Resident intends to stay for the long-haul since house is elevated and he has a couple of boats. LA State Uniform Construction Code adopted by the City of Breaux Bridge for the purpose of regulating construction, reconstruction, alteration, repair, installation of mechanical devices and equipment, the use, occupancy, and maintenance of every building or structure. Amendment of flood damage prevention ordinance on floodways in effect by the City of St. Martinville. After evacuating all of their belongings and leaving their homes due to forced flooding, the flood never came.
Floodproofing	0	0	n/a	n/a
Evacuation	57	12	evacuation and costs; Morganza flooding preparation	Firefighters help restock pantries. “The money that it took for families to comply with the mandatory evacuation was no less than $1,000 per household…As families are coming home, they are faced with drained savings accounts and bare pantries.”; Residents reflect on the flood that never happened. Of 60 structures in the Butte La Rose community, only two flooded from backwater. Morganza Floodway opens. Evacuation plans for animals

Acquisition	11	0	n/a	n/a
Land-use planning	26	1	communities brace for Morganza Flood	Morgan City Mayor identified 10,500 feet of levees for which they requested flood protection baskets as well as manpower from state.
Zoning and development	153	1	mitigation	Officials discuss mitigation measures at public meeting concerning the possibility of the Miss. and Atchafalaya Rivers' rising waters affecting the area via backwater flooding.
Building Codes	12	0	n/a	n/a
Mitigation	10	4	structural mitigation; mitigation plan as a tool; restoration; business continuity	Temporary dam used to prevent expected flooding. Parish Mitigation Plan shows what could be if levee broke. During 2010, 124 applications were funded to return marginal agriculture lands to restored wetlands on 22,544 acres. Company provides disaster restoration services to business and homeowners for every emergency, including floods, fires, storms, and vandalism.

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Newspaper		✓	✓		✓	✓	✓	DFIRMS affect premiums; Morganza flooding preparation; structural mitigation; mitigation plan as a tool; restoration; business continuity
Mitigation Plan	✓	✓		✓	✓		✓	Planning/studies; public awareness; relocation

St. Mary Parish-Summary Page

Website: http://www.parish.st-mary.la.us/
Website News: No News Section
Newspapers: *Daily Review*
St. Mary & Franklin Banner-Tribune (*Same as Daily Review*)

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓		✓					
No			✓		✓	✓	✓	✓	✓

Newspaper: *Daily Review*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Elevation	13	7	master plan meeting; flood maps; flood control structure; poor drainage flood homes	Accuracy of flood maps questioned. Land acquired for flood control structure.
Floodproofing	1	1	flood insurance too costly for payout	While he said he spent $350,000 on flood-proofing his property and moving equipment for the high water, he said his insurance company has said they will give him $1,000. He said he pays $1,600 a year in premiums.
Evacuation	8	3	Emergency Alert System; levees working; create plan	Officials said the levees were doing their job in the city for Tropical Storm Lee. Develop a family disaster plan.
Buy-outs	7	2	land acquisition; businesses learn from previous floods	Possible buy-out of private landowners in the Basin. Business owners know how to mitigate against floods. “We have had similar experiences for maybe five times since the early ’70s. We’ve been very resilient each time. We learn each time, which made us better

				able to cope with the latest flood, which was at record levels."
Acquisition	9	4	land acquired to complete projects; pump station enlarged	Several projects call for land acquisition, road and canal improvement projects, and the Atchafalaya Basin Conservation Fund to provide more public sites in the basin. Leftover funds allow for bigger pump station
Land-use planning	8	3	flood control structure; rock levee prevent erosion; register cell phone for alerts	Flood control structure improvements identified. Landowners consulted and part of the process. The main concern is the cost allocation for the rock that will be used to armor private lands and prevent erosion. The alert system notification can also send emails and text messages.
Zoning and development	51	7	sandbags; restoration; Morganza flooding benefit; flood control structure; drainage fee	Sandbags keep residents dry from Tropical Storm Lee. Morganza flooding could bring on great fishing season since it becomes fertile on its journey from the Mississippi River to the basin. St. Mary Parish getting input on coastal restoration projects from Plaquemines Parish. Sunken barge is replaced with permanent flood control structure. Monthly drainage fee charged to get pumps on again—residents don't seem to mind.
Building Codes	3	1	floodproofing your home	Making your home stronger, safer and smarter by including hazard-resistant improvements including hurricane and flood-resistant changes whenever you remodel or restore your home. Reichel explained specific measures to improve window, roof, and wall protection.
Drainage projects	22	7	drainage improvements; land acquired for basin; retrofitting; money sought by levee district	Near school; to open bayou. Land acquisition for Atchafalaya Basin; land will only be acquired from willing sellers. Water plant building needs improvements. St. Mary Parish Levee District agreed to seek financing of $2.5 million for up to five years from the State of LA's Bond Commission to help it finance its operations. The funding is to tide the levee district over after all of its expenses from this year's flood fight.
Mitigation	4	2	Mitigation Funds allocated	Projects include mitigation planning at the port and for floodproofing five buildings in parish. They set a budget of $130,000 for window film, reinforcing doors, and roofing repairs for these five buildings.

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Sign up for emergency notifications.
Newspaper		✓	✓	✓			✓	Master plan meeting; flood maps; flood control structure; flood insurance too costly for payout; Emergency Alert System; levees working; businesses learn from previous floods; pump station enlarged; rock levee prevents erosion; sandbags; restoration; retrofitting; Mitigation Funds allocated
Mitigation Plan	✓	✓		✓	✓		✓	Public awareness; relocation

St. Tammany Parish-Summary Page

Website: http://www.stpgov.org/
Website News: *Current News*
Newspapers: *News Banner*
Slidell Sentry-News (same as *News Banner*)
St. Tammany News (same as *News Banner*)

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓			✓	✓	✓	✓	✓
No			✓	✓					

Website News: *Current News*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Not searchable by keyword	n/a	23	flooding; drainage; land erosion; CRS score reduced NFIP premium; parish helping other parish; comprehensive parish maps; HMGP funds get projects moving; coastal restoration; zoning; berm elevation	Tropical Storm Lee flooding; drainage projects underway. Collectively, residents of unincorporated St. Tammany Parish will have an extra $1.9 million dollars in their pockets in the coming year due to a decrease in premiums paid to the National Flood Insurance Program. The savings to citizens is the result of improving St. Tammany's CRS rating from Class 9 to Class 7. With Mississippi River water at a high level, crews leave St. Tammany to help St. Mary Parish create sandbags in preparation for flooding. Important and useful maps pertaining to the parish can be viewed and printed from the website. Fire stations and districts, zoning information, flood zones, recreation districts and city boundaries may be viewed. A total of $307,430 was awarded in Hazard Mitigation Grants in 2010 from the US Government; $10,538,813 is pending in the review process. Under new LA law, commissioners must attend four hours of training each year on planning and zoning. Phase of plan will raise an existing berm from approximately 6 feet to 12 feet of elevation.

Newspaper: ***News Banner***

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Elevation	41	7	flood insurance; residents eager for new flood maps; government building floodproofed; flood control structures	CRS score has lowered flood insurance premiums. Parish encourages residents to purchase flood insurance. Floodwall built and levees raised at entrance of Causeway bridge. School Board denied Katrina loan forgiveness.
Floodproofing	0	0	n/a	n/a
Evacuation	57	21	evacuation plan; hurricane preparedness; levee protection; include kids in planning	St. Tammany reaching out to help St. Mary Parish from Morganza flooding. The fire district purchased boats to assist elderly after flooding. It is important to be prepared even at the end of storm season. Federal plea to include kids in disaster plans.
Acquisition	3	1	Housing Revitalization Plan	Plan pushes to maintain look of the neighborhood, including raised foundations. Funds available for acquisitions and rehabilitation.
Land-use planning	43	7	reclaim swamp; restoration; wetland restoration following oil spill	A breakwater will be used to protect the cypress trees and the reclaimed land from erosion. Land used for developed church. Church donates 80 acres of land to parish for wetland preservation. The project's purpose is to test different techniques for wetland restoration to see what works best and then implement the most successful technologies.
Land Zoning	39	2	TDR plan and drainage improvements	Transferable Development Rights (TDR) program would help plan future growth as well as preserve lands such as marshlands, forests, green spaces, and farms.
Building Codes	34	3	drainage problems; meeting to suggest future growth	Drainage top priority for mayoral candidate. Grant funding for the plan was secured from the Louisiana Recovery Authority Comprehensive Resiliency Program. The capability to anticipate risk, limit impact, and bounce back in the face of turbulent change was the basis for the project's LRA funding.

Drainage projects	114	15	apartment complex bad for drainage; CRS rating improvement lowers insurance premiums; higher census numbers equal higher tax dollars	Discussed the development and the effects it will have on its neighbors in regard to drainage, erosion of land and front yards and costs to the city to maintain the development. Lots of drainage projects underway. Parish President Kevin Davis was informed by FEMA this week that the parish's NFIP Community Rating System has been increased from a 9 to a 7, which means a 10 to 15 percent reduction in flood insurance premiums. Maybe now the parish will be able to finance road and drainage projects that have been postponed due to lack of money.
Mitigation	17	8	project redefined; seeking funds; wetlands restoration; levee construction	Parish seeking approval for a 5.5 mile breakwater to slow coastal erosion and prevent tidal surges in St. Tammany. Mandeville looking to restore wetlands—plan is to restore functional wetlands hydrology while routing the Galvez Outfall storm water through restored wetlands

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website	✓ (berm)				✓		✓	Flooding; land erosion; CRS score reduced NFIP premium; parish helping other parish; comprehensive parish maps; HMGP funds get projects moving; coastal restoration.

Newspaper		✓ (non-resident-ial)	✓				✓	Flood insurance; flood control structures; include kids in plans; wetland restoration; CRS rating lowers insurance premiums
Mitigation Plan	✓			✓				Structural flood control; retrofitting; relocation

Terrebonne Parish-Summary Page

Website: http://www.tpcg.org/
Website News: *News Archives*
Newspapers: *Courier (*same as Lafourche's *Daily Comet*)
Bayou Business Review (same as the *Courier*)
Bayou Catholic (Diocese of Houma-Thibodaux)
Business News (really generic site*)*

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes	✓	✓	✓	✓	✓	✓			✓
No							✓	✓	

Website News: *News Archives*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Elevation	2	2	flood preparation; mitigation funding	Residents urged to prepare for anticipated flooding from Morganza. Parish asking eligible residents to apply for mitigation programs.
Floodproofing	0	0	n/a	n/a

Evacuation	16	9	flood preparation; citizen preparedness; evacuation orders; voluntary	Prepare for Tropical Storm Lee. The Parish OHSEP's office is offering an in-depth disaster preparedness class for residents. Parish making use of Tiger Dams to suppress backwater flooding caused by Morganza opening. Evacuation not mandatory for Morganza flooding. FEMA partnered with NOAA on flood preparedness education.
Acquisition	0	0	n/a	n/a
Land-use planning	0	0	n/a	n/a
Zoning and development	3	3	master plan meetings; plan update	Encourages resident input. Parish seeking consultants to update plan.
Drainage projects	2	1	drainage projects	Town hall meeting held to inform residents of drainage projects.
Mitigation	0	0	n/a	n/a

Newspaper: *Courier (*see Lafourche's *Daily Comet*)

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website			✓				✓	Flood preparation; mitigation funding; master plan meeting; plan update; sign up for emergency notifications.

Newspaper	✓		✓	✓ (green space)	✓ (for businesses)		✓	Retrofitting; flood & hurricane preparedness; levee construction; flood maps; restoration; emergency alerts; levees worked; master plan meetings; BP funds; flood control structure Netherlands-based; public awareness; mitigation projects in response to past storms
Mitigation Plan	✓	✓		✓	✓		✓	Retrofitting; planning/studies; NFIP/CRS; public awareness; generators

Vermilion Parish-Summary Page

Website: http://www.vppj.org/
Website News: *Latest News* (links don't work)
Newspaper: *Vermilion Today.com (all in one newspaper online: incorporates Abbeville Meridional, Kaplan Herald, and The Gueydan Journal)*

Elements Found on Parish Website

	Code of Ordinance	Floodplain Ordinance	Parish Emergency Plan	Emergency Alert System	Maps	Storm Preparedness Materials	Hazard Mitigation Plan	Parish Evacuation Plan	Comprehensive Plan
Yes						✓			
No	✓	✓	✓	✓	✓		✓	✓	✓

Newspaper: *Vermilion Today.com*

Keyword	# of articles from search	# of relevant articles	Themes	Notes
Elevation	33	13	Elevation worked; mitigation funds; contractor corruption; new FIRMS; levee construction	Houses elevated since Rita and Ike did not flood for Tropical Storm Lee. $40,000 available for two programs: Foundation Reconstruction Program to elevate their homes and Homeowner Compensation Program to provide unmet funding needs for residents who have already completed the elevation process. $100,000 available to elevate, but the program isn't well implemented. New flood maps could affect insurance premiums.
Floodproofing	0	0		

Evacuation	22	3	hurricane preparedness	Plans are encouraged, and evacuation is promoted as a life saving mechanism.
Acquisition	0	0		
Land-use planning	14	2	coastal restoration	$900,000 in funds will be used not only to maintain our treasured coastline, but to educate the public of its importance as well.
Zoning and development	0	0		
Building Codes	0	0		
Drainage projects	20	1	drainage issue	Pump worker took the day off, pump was clogged and caused street flooding.
Mitigation	16	3	new FIRMS; floodwall protection; funding concerns	New flood maps are released. Project will consist of building berms and flood walls at five feet high around 7th Ward. The wall will help keep future storm surges from flooding the school, which has been flooded twice in six years. HMGP funds delayed to contractors.

Types of Mitigation

	Elevation	Flood Proofing	Evacuation Plans	Voluntary Buy-Outs	Land-Use Planning or Zoning that Discourages Development in Hazard Prone Areas	Building Codes that Foster Storm-and Flood-Resistant Re/Construction	Storm-Water Management	Other
Website	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Newspaper	✓						✓	Mitigation funds and concerns; contractor corruption; levee construction; hurricane preparedness; coastal restoration; New FIRMS; floodwall protection
Mitigation Plan	✓	✓		✓	✓	✓		Structural flood control; retrofitting; public awareness; warning systems; generators; safe rooms/shelters

Appendix H-2

Community Participation in Nonstructural Programs

RESTORE THE MISSISSIPPI RIVER DELTA
NATIONAL WILDLIFE FEDERATION

Climate change is predicted to bring stronger hurricanes, rising seas, changing weather patterns, and other effects. These trends will put increasing pressure on south Louisiana, a region already facing crisis level wetland loss and subsidence rates. Levees and other structural measures that reduce flooding hazards offer one set of tools for meeting these challenges. Another set of tools, often called "nonstructural measures," is equally important. Nonstructural measures include: flood prevention through land use planning, property protection through flood proofing and elevation, emergency services, and public information.

In 2010 and 2011, the National Wildlife Federation contracted with National Hazard Mitigation Association (NHMA) to study how nonstructural climate change adaptation methods were viewed and being adopted in south Louisiana. This appendix reviews parish participation in programs designed to encourage the adoption of nonstructural climate change adaptation measures. The programs themselves are explained, and parish participation in each is summarized in the charts below.

Description of Nonstructural Programs

The National Flood Insurance Program[1]: Flood damage repair costs for buildings and their contents are rising, and the National Flood Insurance Program (NFIP) is designed to provide a disaster assistance alternative to reduce these costs. The NFIP is a federal program that allows property owners to purchase flood insurance in exchange for compliance with flood damage regulations that reduce flood losses through state and community floodplain management. To participate in the NFIP, a community must adopt and enforce a floodplain ordinance that reduces future flood risk to new construction and is approved by the federal government. There are three basic components of the program: identifying and mapping flood-prone communities, the adoption and enforcement of floodplain management regulations, and the provision of flood insurance.

- Minimum Requirements: The NFIP floodplain management requirements direct communities to reduce threats to lives and potential property damage. These requirements state that new construction, substantially improved, or substantially damaged existing buildings in A Zones—all areas in the floodplain mapped on the Flood Insurance Rate Map—must have their lowest floor (including basement) raised to or above the Base Flood Elevation (BFE). Non-residential, A Zone structures must be either elevated or dry-floodproofed (see Appendix A-1 for details). In V Zones—coastal high hazard areas—all new construction or substantially improved buildings must be elevated on piles and columns with the bottom of the lowest floor's lowest horizontal structural member elevated to or above the BFE.
- Results: The NFIP regulations for new construction resulted in approximately $1 billion less in claimed losses each year. Structures built to NFIP criteria experience 80% less damage through reduced frequency and severity of losses.

[1] FEMA's National Flood Insurance Program. Program Description. August 1, 2002

The Community Rating System[2]: Adherence to NFIP regulations helps communities enforce the minimum standards of floodplain management, but the goal of the Community Rating System (CRS) is to take community action a step further. The CRS is a voluntary program first implemented in 1990 for communities that participate in the National Flood Insurance Program (NFIP). It rewards communities that implement programs that exceed the minimum requirements of the NFIP by reducing flood insurance premiums to residents in those communities. CRS credit can serve as a measurement for mitigation activities and indicates which communities are working hard to reduce their flood losses.

CRS Premium Reductions

Class	Points	Premium Reduction In Floodplain	Outside Floodplain
1	4,500+	45%	10%
2	4,000–4,499	40%	10%
3	3,500–3,999	35%	10%
4	3,000–3,499	30%	10%
5	2,500–2,999	25%	10%
6	2,000–2,499	20%	10%
7	1,500–1,999	15%	5%
8	1,000–1,499	10%	5%
9	500– 999	5%	5%
10	0 – 499	0	0

CRS Premium Reductions by Class

The CRS assigns participating communities a class between 10 and 1; the lower the class rating, the higher the discount on flood insurance premiums.[3] As indicated in the CRS Premium Reductions box to the right, a better (lower) class rating means additional discounts to policyholders because the actions of its floodplain management program exceed minimum standards. Communities wanting the greatest flood insurance discount should strive for a CRS rating of 1. To work toward this goal, communities must enforce the floodplain management regulations of the NFIP, be proactive in reducing flood damage, and institute and maintain a comprehensive approach to floodplain management.

- Community Responsibility. The "community" in CRS suggests a broad base of participants, which is needed for successful floodplain management. From the state to the resident, the CRS strives to encourage all community members to minimizing flood losses. Ultimately, the responsibility and the reward of participation in the Community Rating System falls to local government, since in the end, it is local government that is responsible for the community's floodplain management approach and documentation. The residents in that community also share in the responsibility of reducing flood losses. By adhering to the community's flood damage reduction ordinances, reporting flood conditions, and participating in outreach activities, residents can play an integral role in the reduction of flood losses.
- How it works. A community that has not been formally rated in the CRS is a Class 10 community by default. Class 10 communities do not receive discounts on flood insurance premiums and do not have to maintain documentation of their floodplain management activities beyond what is needed for compliance with the National Flood Insurance Program. The first step in joining the CRS involves the community's chief executive officer appointing CRS Coordinator to take on the application work. Once the CRS's Insurance Services Officer confirms that the

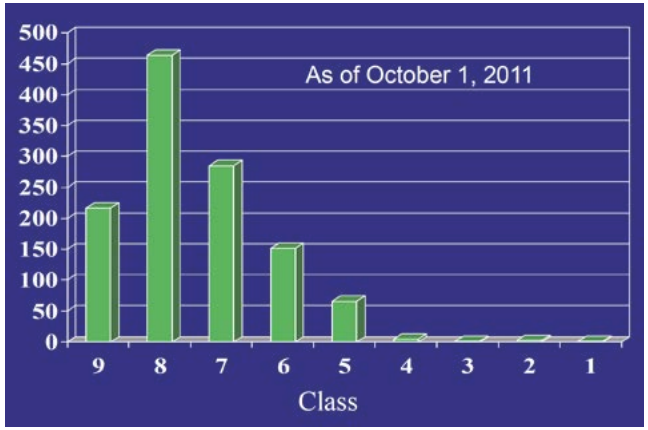
[2] UNO-CHART. Erin Merrick. *The Guidebook to Conducting Repetitive Loss Area Analyses*. Draft Report. 2011.

[3] FEMA. Community Rating System. Retrieved on 9/23/11. http://www.fema.gov/business/nfip/crs.shtm.

community will likely receive at least 500 points, he/she will schedule a verification visit to verify and review the stated activities. During this visit, additional activities can be discovered, and rules about documenting activities can be verified. After the verification visit, the community is assigned a class rating that corresponds to the level of activities that the locality is performing and that corresponds with a discount in flood insurance premiums. Each corresponding improvement in class adds 5% to the overall discount in flood insurance premiums to each policyholder in the community's Special Flood Hazard Area.

Requirements. As a participating member of the CRS, the community adopts a number of responsibilities critical to maintaining its rating in the CRS. The community must maintain all permitting records and previous and current flood insurance rate maps and flood insurance studies for the community. Verification visits occur every five years to determine whether the community is maintaining the same level of credited activities. Documentation of all floodplain activities must be maintained throughout the verification cycle and presented during the visit. However, if a community has recently committed to significantly improving its floodplain management program, the CRS Coordinator may request a modification, which will mean an additional verification visit. The credit points must be maintained over time to maintain class ratings.

- CRS Benefits and Costs. While there is no monetary fee for participation in the CRS, some of the activities may involve implementation costs. A closer look at the floodplain management activities detailed in the CRS Coordinator's Manual shows that many of the activities listed are those that communities are already undertaking, such as outreach to flood prone areas, freeboard ordinances, maintaining elevation certificates, and reading and interpreting Flood Insurance Rate Maps for interested residents. The CRS allows communities to compare their floodplain management program to others nation-wide. As indicated in the table to the right, most CRS communities are ranked as Classes 8 and 7.[4]



CRS Communities by Class Ranking

Participation in Louisiana

This appendix examines the types of non-structural mitigation measures being implemented in coastal Louisiana. CRS data shows the specific activities that communities are currently undertaking.

[4] As of October 1, 2011 provided by the Insurance Services Office who oversees the CRS for FEMA.

CRS data from May 2011 contains 25 communities within the targeted coastal parishes, including: Ascension, Calcasieu, Jefferson, Livingston, Orleans, St. Charles, St. John, St. Mary, St. Tammany, and Terrebonne; and the following cities in these parishes: Denham Springs, French Settlement, Gonzales, Gretna, Harahan, Houma, Kenner, Lutcher, Lake Charles, Mandeville, Morgan City, Slidell, Sorrento, Walker, and Westwego. Parish data are for unincorporated areas only.

Data from FEMA's Community Status Book Report identifies the LA communities currently participating in the National Flood Insurance Program (NFIP). It can be assumed that these communities are enforcing the minimum floodplain management requirements of the NFIP, while CRS communities are implementing programs that exceed the NFIP criteria (see Table 1).

Table 1
CRS vs. NFIP: Coastal Parish Participation

NFIP Community Name	Parish			CRS Community Name	Parish
ABBEVILLE, CITY OF	Vermilion			ASCENSION PARISH *	Ascension
ABITA SPRINGS, TOWN OF	St. Tammany			CALCASIEU PARISH *	Calcasieu
ALBANY, VILLAGE OF	Livingston			DENHAM SPRINGS, CITY OF	Livingston
ARNAUDVILLE, TOWN OF	St. Martin			FRENCH SETTLEMENT, VILLAGE OF	Livingston
ASCENSION PARISH *	Ascension			GONZALES, TOWN OF	Ascension
ASSUMPTION PARISH *	Assumption			GRETNA, CITY OF	Jefferson
BALDWIN, TOWN OF	St. Mary			HARAHAN, CITY OF	Jefferson
BERWICK, TOWN OF	St. Mary			HOUMA, CITY OF	Terrebonne
BREAUX BRIDGE, TOWN OF	St. Martin			JEFFERSON PARISH *	Jefferson
BROUSSARD, TOWN OF	St. Martin			KENNER, CITY OF	Jefferson
CALCASIEU PARISH *	Calcasieu			LAKE CHARLES, CITY OF	Calcasieu
CAMERON PARISH *	Cameron			LIVINGSTON PARISH *	Livingston
COVINGTON, CITY OF	St.Tammany			LUTCHER, TOWN OF	St. James
DE QUINCY, CITY OF	Calcasieu			MANDEVILLE, TOWN OF	St. Tammany
DELCAMBRE, TOWN OF	Vermilion/Iberia			MORGAN CITY, CITY OF	Saint Mary
DENHAM SPRINGS, CITY OF	Livingston			ORLEANS PARISH	Orleans
DONALDSONVILLE, CITY OF	Ascension			SLIDELL, CITY OF	St. Tammany

NFIP Community Name	Parish			CRS Community Name	Parish
ERATH, TOWN OF	Vermilion			SORRENTO, TOWN OF	Ascension
FOLSOM, VILLAGE OF	St. Tammany			ST TAMMANY PARISH *	St. Tammany
FRANKLIN, CITY OF	St. Mary			ST JAMES PARISH*	St. James
FRENCH SETTLEMENT, VILLAGE OF	Livingston			ST. CHARLES PARISH *	St. Charles
GOLDEN MEADOW	Lafourche			ST. JOHN THE BAPTIST PARISH *	St. John
GONZALES, CITY OF	Ascension			TERREBONNE PARISH	Terrebonne
GRAMERCY, TOWN OF	St. James			WALKER, TOWN OF	Livingston
GRAND ISLE, TOWN OF	Jefferson			WESTWEGO, CITY OF	Jefferson
GRETNA, CITY OF	Jefferson				
GROSSE TETE, VILLAGE OF	Iberville				
HARAHAN, CITY OF	Jefferson				
HENDERSON, TOWN OF	St. Martin				
HOUMA, CITY OF	Terrebonne				
IBERIA PARISH *	Iberia				
IBERVILLE PARISH *	Iberville				
IOWA, TOWN OF	Calcasieu				
JEAN LAFITTE, TOWN OF	Jefferson				
JEANERETTE, CITY OF	Iberia				
JEFFERSON PARISH *	Jefferson				
KAPLAN, CITY OF	Vermilion				
KENNER, CITY OF	Jefferson				
KILLIAN, VILLAGE OF	Livingston				
LAFOURCHE PARISH *	Lafourche				
LAKE CHARLES, CITY OF	Calcasieu				
LIVINGSTON PARISH *	Livingston				
LIVINGSTON, TOWN OF	Livingston				
LOCKPORT, TOWN OF	Lafourche				
LOREAUVILLE, VILLAGE OF	Iberia				

NFIP Community Name	Parish			CRS Community Name	Parish
LUTCHER, TOWN OF	St. James				
MADISONVILLE, TOWN OF	St. Tammany				
MANDEVILLE, CITY OF	St. Tammany				
MARINGOUIN, TOWN OF	Iberville				
MAURICE, VILLAGE OF	Vermilion				
MORGAN CITY, CITY OF	St. Mary				
NAPOLEONVILLE, TOWN OF	Assumption				
NEW IBERIA, CITY OF	Iberia				
NEW ORLEANS, CITY & PARISH *	Orleans				
PARKS, VILLAGE OF	St. Martin				
PATTERSON, CITY OF	St. Mary				
PEARL RIVER, TOWN OF	St. Tammany				
PLAQUEMINE, CITY OF	Iberville				
PORT VINCENT, VILLAGE OF	Livingston				
ROSEDALE, VILLAGE OF	Iberville				
SLIDELL, CITY OF	St. Tammany				
SORRENTO, TOWN OF	Ascension				
SPRINGFIELD, TOWN OF	Livingston				
ST. BERNARD PARISH *	St. Bernard				
ST. CHARLES PARISH *	St. Charles				
ST. GABRIEL, TOWN OF	Iberville				
ST. JAMES PARISH *	St. James				
ST. JOHN THE BAPTIST PARISH *	St. John				
ST. MARTIN PARISH *	St. Martin				
ST. MARTINVILLE, CITY OF	St. Martin				
ST. MARY PARISH *	St. Mary				
ST. TAMMANY PARISH *	St. Tammany				
SULPHUR, CITY OF	Calcasieu				

NFIP Community Name	Parish			CRS Community Name	Parish
TERREBONNE PARISH *	Terrebonne				
THIBODAUX, CITY OF	Lafourche				
VERMILION PARISH *	Vermilion				
VINTON, TOWN OF	Calcasieu				
WALKER, TOWN OF	Livingston				
WESTLAKE, CITY OF	Calcasieu				
WESTWEGO, CITY OF	Jefferson				
WHITE CASTLE, TOWN OF	Iberville				

*Parish refers to unincorporated areas only.

As mentioned in the CRS description above, communities can improve their class rating by participating in floodplain management activities. There are eighteen (18) activities through which communities can receive CRS credit:

- Activity 310 — Elevation Certificates
- Activity 320 — Map Information Service
- Activity 330 — Outreach Projects
- Activity 340 — Hazard Disclosure
- Activity 350 — Flood Protection Information
- Activity 360 — Flood Protection Assistance
- Activity 410 — Floodplain Mapping
- Activity 420 — Open Space Preservation
- Activity 430 — Higher Regulatory Standards
- Activity 440 — Flood Data Maintenance
- Activity 450 — Stormwater Management

- Activity 510 — Floodplain Management Planning
- Activity 520 — Acquisition and Relocation
- Activity 530 — Flood Protection
- Activity 540 — Drainage System Maintenance
- Activity 610 — Flood Warning and Response
- Activity 620 — Levees
- Activity 630 — Dams

Of these 18 activities, only those that directly mitigate flood losses were analyzed in the NHMA study. This review did not include elevation certificates, mapping, open space preservation, levees, or dams. The activities analyzed by the NHMA study are broken down into four series: Public Information, Mapping and Regulations, Flood Damage Reduction, and Flood Preparedness. Each series is described below.

Public Information (Series 300): This series of credits is a good indicator that the community has an active public information program to advise people of flood hazards, flood insurance options, and ways they can protect themselves and their property from flooding. The higher the points, the more the community does. In many cases, such as Activity 320, Louisiana communities max out on the credit.

- c320 (Credit for Map Information Service). Objective[5]: Provide Inquirers with Flood Hazard Information. Max points = 140[6]
- c340 (Hazard Disclosure). Objective: Disclose the flood hazard before the lender notifies prospective buyers of the need for flood insurance. Max points = 81
- c350 (Flood Protection Information). Objective: Provide the public with additional information. Max points = 102
- LIB (Keeping publications in a library). Max points = 25
- LPD (Having locally pertinent documents in the library). Max points = 5
- c330 (Outreach Projects). Objective: Provide information needed to increase awareness and motivate actions to reduce flood damage, encourage flood insurance coverage, and protect natural floodplain functions. Max points = 380
- OPF (Outreach Project to all Floodplain Properties). Max points = 130

[5] CRS objectives/explanations come from the 2012 CRS *Coordinator's Manual* Changes.
[6] The max point numbers were found in the 2007 *CRS Coordinator's Manual* and are expected to change in 2012.

- OPC (Outreach Project to everyone in the Community**)**. Max points = 60
- WEB (Providing information via a website). Max points = 72
- c360 (Flood Protection Assistance). Objective: Provide one-on-one help in protecting property from flooding. Max points= 71
- There is also a proposed change in the 2012 *CRS Coordinator's Manual Changes* to add Activity 370, which will promote flood insurance coverage. Credit will be awarded incrementally for following a four step process that includes assessing needs and purchasing appropriate insurance over time.

Table 2
Public Information (CRS Series 300) Coastal Parish Participation

		Map Info	Outreach to Community	Outreach to Floodplain	Hazard Disclosure	Library	Local Documents in Library	Website	Direct Assistance	**Total**
	National Average	139	33	87	16	19	3	35	50	**264**[7]
Parish	Name									
Ascension	ASCENSION PARISH *	140	0	78	5	25	5	24	59	**336**
Ascension	GONZALES, TOWN OF	140	14	0	5	25	5	0	0	**189**
Ascension	SORRENTO, TOWN OF	140	46	0	5	23	4	0	0	**218**
Calcasieu	CALCASIEU PARISH *	140	15	0	20	21	0	36	5	**237**
Calcasieu	LAKE CHARLES, CITY OF	140	0	92	5	11	5	0	7	**260**
Jefferson	GRETNA, CITY OF	140	40	0	15	13	1	36	63	**308**
Jefferson	HARAHAN, CITY OF	140	44	97	5	25	2	33	59	**405**
Jefferson	JEFFERSON PARISH *	140	44	95	5	25	5	37	66	**417**
Jefferson	KENNER, CITY OF	140	40	86	5	25	5	51	66	**418**

[7] The total national average is not the total of the listed averages. It is the average total score for all the elements listed.

		Map Info	Outreach to Community	Outreach to Floodplain	Hazard Disclosure	Library	Local Documents in Library	Website	Direct Assistance	**Total**
Jefferson	WESTWEGO, CITY OF	140	34	80	5	23	2	25	66	**375**
Livingston	DENHAM SPRINGS, CITY OF	140	35	0	15	18	1	0	66	**275**
Livingston	FRENCH SETTLEMENT,VILLAGE	140	23	27	10	20	1	38	0	**259**
Livingston	LIVINGSTON PARISH *	140	29	0	5	20	1	0	0	**195**
Livingston	WALKER, TOWN OF	140	33	0	5	20	1	0	66	**265**
Orleans	ORLEANS PARISH	140	50	107	5	20	0	0	66	**388**
St. Mary	MORGAN CITY, CITY OF	140	56	121	15	23	5	32	62	**454**
St. Charles	ST CHARLES PARISH *	140	42	0	20	23	5	25	66	**321**
St. James	LUTCHER, TOWN OF	140	47	0	5	23	1	0	0	**216**
St. James	ST JAMES PARISH*	140	48	104	20	25	1	26	66	**430**
St. John	ST. JOHN THE BAPTIST PARISH *	140	52	0	5	25	5	30	0	**257**
St. Tammany	MANDEVILLE, TOWN OF	140	44	96	5	23	3	36	66	**413**
St. Tammany	SLIDELL, CITY OF	140	29	73	10	23	5	35	0	**315**
St. Tammany	ST TAMMANY PARISH *	140	0	0	10	20	5	0	0	**175**
Terrebonne	HOUMA, CITY OF	140	37	75	10	20	3	36	63	**384**
Terrebonne	TERREBONNE PARISH	140	37	75	10	20	3	36	63	**384**

*Parish refers to unincorporated areas only.

The communities with scores at 400 or above in Table 2, indicating high levels of interest and activity in the public information series, are the Cities of Harahan, Jefferson Parish, City of Kenner, City of Morgan City, St. James Parish and the Town of Mandeville.

Each element's national average[8] was derived by adding the number of communities that have points for that particular element and dividing by the number of communities added together. That is why the total average added across does not add up. This is true for the average total of all the tables in this document.

[8] Source: National Averages in CRS Data-Louisiana, May 1, 2011, Excel sheet provided by ISO.

The total average 264 is the national average for all the elements in this series. Three-fourths of the targeted parishes and communities are doing more community outreach activities than the rest of the nation, while only a third are doing more floodplain outreach, as shown in Table 2. Further review indicates that almost all of the communities implement an annual outreach project to everyone in the community, and slightly more than half of these communities send a project to all their floodplain properties each year, though none of the coastal communities earn maximum points for either outreach category. Only eight communities in the nation get the maximum amount of points for Outreach Projects to Community or Outreach Projects for Floodplain. Disclosing flood hazard information of properties before they are purchased by prospective buyers is not a high-level activity, as all but three of the communities score below the national average of 16 points on this activity.

The combined communities of coastal Louisiana score higher than the national average when it comes to providing the public with additional flood protection information. All of the communities listed in Table 2 have flood protection publications in their libraries. All but two of those libraries showcase locally pertinent documents to their patrons, while ten communities scored the maximum value for this activity. Nine of the 25 communities do not have websites or the website does not meet the prerequisites for the credit or in some cases, the community has not applied for the credit. While eight of the targeted coastal communities do not have credit for flood protection assistance, 15 of the 17 communities that do have credit score higher than this activity's national average of 50 points, signifying that providing one-on-one help in protecting property from flooding is important to coastal Louisiana.

Mapping and Regulations (Series 400): This series of credits indicates whether the community has regulatory standards for new floodplain development that are above the minimum NFIP criteria.

- c430 (Higher Regulatory Standards). Objective: Require that new development be provided with more protection than is required by the NFIP's minimum criteria. Max points = 2740
- cSTF (Staffing). Based on certification and training of the community's staff). Max points = 50
- c450 (Stormwater Management). Objective: Minimize the impact of new developments on surface water drainage and runoff. Max points = 520
- cSMR (Stormwater Management Regulations). Credit for requiring all new developments to retain or detain their excess stormwater runoff on site. Max points = 225
- cFRX (Freeboard in X Zones)-Max points = 150

Table 3

Mapping and Regulation (CRS Series 400): Coastal Parish Participation

		Higher Regulatory Standards	Professional Staff	Stormwater Management	Local Drainage Protection	**Total**
	National Average	301	21	66	28	**315**
Parish	Name					
Ascension	ASCENSION PARISH *	211	5	0	0	**211**[9]
Ascension	GONZALES, TOWN OF	5	5	0	0	**5**
Ascension	SORRENTO, TOWN OF	0	0	0	0	**0**
Calcasieu	CALCASIEU PARISH *	78	30	0	0	**78**
Calcasieu	LAKE CHARLES, CITY OF	0	0	0	0	**0**
Jefferson	GRETNA, CITY OF	100	5	0	20	**120**
Jefferson	HARAHAN, CITY OF	95	5	0	0	**95**
Jefferson	JEFFERSON PARISH *	139	10	15	0	**154**
Jefferson	KENNER, CITY OF	200	0	20	20	**240**
Jefferson	WESTWEGO, CITY OF	95	5	0	0	**95**
Livingston	DENHAM SPRINGS, CITY OF	65	5	0	50	**115**
Livingston	FRENCH SETTLEMENT,VILLAGE	0	0	0	0	**0**
Livingston	LIVINGSTON PARISH *	0	0	0	0	**0**
Livingston	WALKER, TOWN OF	0	0	0	0	**0**
Orleans	ORLEANS PARISH	62	0	0	75	**137**
St. Mary	MORGAN CITY, CITY OF	85	50	0	0	**85**
St. Charles	ST CHARLES PARISH *	50	50	0	50	**100**
St. James	LUTCHER, TOWN OF	0	0	0	0	**0**

[9] The trained professional staff element is not calculated in the total amount for the 400 series since it is included in the higher regulatory standards column.

		Higher Regulatory Standards	Professional Staff	Stormwater Management	Local Drainage Protection	**Total**
St. James	ST JAMES PARISH*	201	20	0	0	**201**
St. John	ST. JOHN THE BAPTIST PARISH *	95	5	0	0	**95**
St. Tammany	MANDEVILLE, TOWN OF	284	25	0	50	**334**
St. Tammany	SLIDELL, CITY OF	190	10	7.5	20	**217.5**
St. Tammany	ST TAMMANY PARISH *	225	0	0	20	**245**
Terrebonne	HOUMA, CITY OF	241	25	15	75	**331**
Terrebonne	TERREBONNE PARISH	241	25	14.25	75	**330.25**

*Parish refers to unincorporated areas only

Not much activity has been dedicated to floodplain and stormwater management regulations as dictated by Table 3. The parishes/communities with scores of 300 or above, indicating high levels of interest and activity in the mapping and regulations series, are the Town of Mandeville, City of Houma and Terrebonne Parish. All of the targeted communities are below the national average of 301 points for requiring new development to be provided with more protection than the minimum criteria set forth by the NFIP. None has credit for protection of critical facilities, possibly because the regulations for this activity state they must be enforced in the 500-year floodplain, which does not apply to this study area. Of the 25 communities listed, nine are getting no credit for having certified or trained regulatory staff.

Managing stormwater impacts is not a priority activity in coastal LA. Only half of the targeted communities participate in the actual management of stormwater in their areas. Five communities have credit for stormwater management regulations, none of which exceed 20 points out of a possible 225 or scored above the national average of 66 points. The regulations require all new developments to retain or detain their excess stormwater runoff on site.

Freeboard in X Zones (FRX) is determined by the type and amount of freeboard required in the following different flood zones: B, C, D, or X Zones (FX). X zones[10] are shown as Zones B and C on older FIRMs indicating areas with moderate to minimal flood hazards. Communities who participate in Freeboard in X zones receive points for requiring all new buildings (not just those in floodplains) to be protected from local drainage problems. Ten communities have received credit for adding freeboard to new buildings in X zones, but score on the low end of the possible points with scores ranging from 20-75 points. This is a key regulation in areas protected by levees.

[10] The Flood Zones are specified on the Repetitive Flood Portal created by UNO-CHART through FEMA funding. http://floodhelp.uno.edu/Portal.aspx?ContentID=31. Retrieved on 9/26/11.

The Insurance Services Office assigns each community a grade of 1 (best) to 10 (no recognized program) for the Building Code Effectiveness Grading Schedule (BCEGS), just like the CRS ratings. The grades are based on an extensive questionnaire and a follow-up verification visit with the community and the ISO's building department. Since BCEGS ratings are only necessary for communities to attain a CRS class 7 or better, this process may be a deterrent to the less active communities from applying for the credit. The BC1 is an indicator of the community's BCEGS classification. It measures how current the code is, level of staffing, legal authorities, and how well the code is enforced.

Six of the twenty-five (25) coastal communities have a CRS class of 7 or better.[11] In Louisiana, generally only communities needing a CRS class of 7 or better get a BCEGS classification. The City of Houma and Terrebonne Parish have the highest BCEGS classification of 4 with 45 points for Building Code credit each, matching the national average for BSEGS, which is between a Class 4 and 5. Louisiana state law requires everyone to adopt the International Building Codes (I-Codes). While no one community has adopted all six of the I-Codes, the majority has implemented most of them.

- Natural Floodplain Functions Series (subset of Mapping and Regulation Series):
  - 430-NBR (Natural/Beneficial Functions Regulations)-Max points = 40
  - 450-ESC (Erosion and Sedimentation Control)-Max = 30
  - 450-WQ (Water Quality Regulations)-Max points = 25

[10] The Flood Zones are specified on the Repetitive Flood Portal created by UNO-CHART through FEMA funding. http://floodhelp.uno.edu/Portal.aspx?ContentID=31. Retrieved on 9/26/11.

[11] CRS Data-Louisiana, May 1, 2011, Excel Sheet provided by ISO.

Table 4
Natural Floodplain Functions (Subset of CRS Series 400): Coastal Parish Participation

		Natural/Beneficial Functions Regulations	Erosion and Sedimentation Control	Water Quality Regulations	**Total**
	National average	9	33	25	
Parish	Name				
Ascension	ASCENSION PARISH *	0	0	0	**0**
Ascension	GONZALES, TOWN OF	0	0	0	**0**
Ascension	SORRENTO, TOWN OF	0	0	0	**0**
Calcasieu	CALCASIEU PARISH *	0	0	0	**0**
Calcasieu	LAKE CHARLES, CITY OF	0	0	0	**0**
Jefferson	GRETNA, CITY OF	0	0	0	**0**
Jefferson	HARAHAN, CITY OF	0	0	0	**0**
Jefferson	JEFFERSON PARISH *	0	0	0	**0**
Jefferson	KENNER, CITY OF	0	35	25	**60**
Jefferson	WESTWEGO, CITY OF	0	0	0	**0**
Livingston	DENHAM SPRINGS, CITY OF	0	0	0	**0**
Livingston	FRENCH SETTLEMENT,VILLAGE	0	0	0	**0**

Livingston	LIVINGSTON PARISH *	0	0	0	**0**
Livingston	WALKER, TOWN OF	0	45	25	**70**
Orleans	ORLEANS PARISH	0	0	0	**0**
St. Mary	MORGAN CITY, CITY OF	0	0	0	**0**
St. Charles	ST CHARLES PARISH *	0	0	0	**0**
St. James	LUTCHER, TOWN OF	0	0	0	**0**
St. James	ST JAMES PARISH*	0	0	0	**0**
St. John	ST. JOHN THE BAPTIST PARISH *	0	0	0	**0**
St. Tammany	MANDEVILLE, TOWN OF	0	35	0	**35**
St. Tammany	SLIDELL, CITY OF	0	30	25	**55**
St. Tammany	ST TAMMANY PARISH *	0	35	0	**35**
Terrebonne	HOUMA, CITY OF	0	30	25	**55**
Terrebonne	TERREBONNE PARISH	0	30	25	**55**

*Parish refers to unincorporated areas only

Louisiana coastal communities have not focused on this category as depicted by Table 4. No community has credit for Natural/Beneficial Functions Regulations. Seven communities have some credit for Erosion and Sedimentation Control; the Town of Walker is the only one with the maximum credit. This credit is given when regulations control erosion and soil loss from any disturbed land. Such regulations are now required by Louisiana state law. Water Quality Regulations require new developments of five acres or more to include in the design of their stormwater management facilities appropriate "best management practices" that will improve the quality of surface water. Communities receiving credit for this aspect are the City of Kenner, Town of Walker, City of Slidell, City of Houma and Terrebonne Parish. Nationally speaking, these five communities match what other CRS communities around the nation are doing in regulating their water quality.

Flood Damage Reduction (Series 500): The key elements for which credit can be attained in the 500 series are shown in Table 6. The following indicate flood damage reduction:

- c520 (Acquisition and Relocation). Objective: Acquire, relocate, or otherwise clear buildings out of flood hazard area. Max points = 3,200
  - bAR (Buildings Acquired or Relocated)
  - bRL (Buildings on the Repetitive Loss list that have been acquired or relocated)
  - bSRL (Buildings on the Severe Repetitive Loss list that have been acquired or relocated)

Table 5
Acquisition and Relocation (Subset of CRS Series 500): Coastal Parish Participation

Parish	Name	c520	bAR	bRL	bSRL
Ascension	ASCENSION PARISH *	0	0	0	0
Ascension	GONZALES, TOWN OF	0	0	0	0
Ascension	SORRENTO, TOWN OF	0	0	0	0
Calcasieu	CALCASIEU PARISH *	115	6	4	3
Calcasieu	LAKE CHARLES, CITY OF	0	0	0	0
Jefferson	GRETNA, CITY OF	0	0	0	0
Jefferson	HARAHAN, CITY OF	0	0	0	0
Jefferson	JEFFERSON PARISH *	105	7	7	0
Jefferson	KENNER, CITY OF	0	0	0	0
Jefferson	WESTWEGO, CITY OF	45	0	0	3
Livingston	DENHAM SPRINGS, CITY OF	0	0	0	0
Livingston	FRENCH SETTLEMENT,VILLAGE	0	0	0	0
Livingston	LIVINGSTON PARISH *	0	0	0	0
Livingston	WALKER, TOWN OF	0	0	0	0
Orleans	ORLEANS PARISH	0	0	0	0
St. Mary	MORGAN CITY, CITY OF	0	0	0	0
St. Charles	ST CHARLES PARISH *	20	0	2	0

St. James	LUTCHER, TOWN OF	0	0	0	0
St. James	ST JAMES PARISH*	0	0	0	0
St. John	ST. JOHN THE BAPTIST PARISH *	5	1	0	0
St. Tammany	MANDEVILLE, TOWN OF	30	2	2	0
St. Tammany	SLIDELL, CITY OF	50	0	5	0
St. Tammany	ST TAMMANY PARISH *	265	6	19	3
Terrebonne	HOUMA, CITY OF	40	2	3	0
Terrebonne	TERREBONNE PARISH	300	19	19	1

*Parish refers to unincorporated areas only

Given state and FEMA funding priorities, credit amounts increase for buildings that are removed from the repetitive and severe repetitive loss list, saving a great deal of money that would be lost to flood claims. For each building the community has acquired or relocated (bAR) that is not on the repetitive loss list, five credit points are given. If the building was on the repetitive loss list (bRL), the credit increases to 10. If the building was on the severe repetitive loss list (bSRL), the credit increases to 15.

Acquisition involves buying one or more properties and clearing the site. If there is no building subject to flooding, there is no flood damage. Acquisitions are usually recommended where the flood hazard is so great or so frequent that it is not safe to leave the structure on the site. Due to the high cost and difficulty of obtaining a favorable benefit-cost ratio in shallow flooding areas, acquisitions are reserved for the worst case buildings.

The key finding in Table 5 is that other than St. Tammany and Terrebonne Parishes, no other community is getting much credit for removing buildings. Clearly, acquisition and relocation have not been the priority, as these communities want the people to stay in town. Because residents are staying, many communities are doing more flood protection of existing buildings compared to acquisition of damaged buildings.

Flood Damage Reduction (Series 500) continued:

- Mitigation Planning. Objective: Produce a program of activities that best tackles the community's vulnerability to the hazard and meet other community needs.
- FMP (Floodplain Management Plan) under c510 (Floodplain Management Planning). Credit is given for a 10-step process to prepare, adopt and implement a plan to mitigate the community's flood problems and protect natural floodplain functions. Max points = 294.
- c530 (Flood Protection). Objective: Protect existing buildings from flood damage. Max points = 2,800.
- c540 (Drainage System Maintenance). Objective: Keep the channels and storage basins clear of debris in order to maintain their flood carrying and storage capacity. Max points = 330.

Table 6
Flood Damage Reduction (CRS Series 500): Coastal Parish Participation

		Floodplain Management Planning	Acquisition and Relocation	Flood Protection (Elevation)	Drainage System Maintenance	**Total**
	National Average	122	223	90	201	**308**
Parish	Name					
Ascension	ASCENSION PARISH *	107	0	0	230	**337**
Ascension	GONZALES, TOWN OF	107	0	0	230	**337**
Ascension	SORRENTO, TOWN OF	0	0	0	230	**230**
Calcasieu	CALCASIEU PARISH *	115	20	84	230	**449**
Calcasieu	LAKE CHARLES, CITY OF	94	0	0	80	**174**

		Floodplain Management Planning	Acquisition and Relocation	Flood Protection (Elevation)	Drainage System Maintenance	**Total**
Jefferson	GRETNA, CITY OF	175	0	0	280	**455**
Jefferson	HARAHAN, CITY OF	182	0	0	30	**212**
Jefferson	JEFFERSON PARISH *	164	105	84	330	**683**
Jefferson	KENNER, CITY OF	64	0	0	220	**284**
Jefferson	WESTWEGO, CITY OF	134	45	0	230	**409**
Livingston	DENHAM SPRINGS, CITY OF	0	0	21	200	**221**
Livingston	FRENCH SETTLEMENT,VILLAGE	0	0	0	230	**230**
Livingston	LIVINGSTON PARISH *	63	0	0	265	**328**
Livingston	WALKER, TOWN OF	0	0	0	200	**200**
Orleans	ORLEANS PARISH	0	0	0	230	**230**
St. Mary	MORGAN CITY, CITY OF	128	0	0	280	**408**
St. Charles	ST CHARLES PARISH *	125	20	0	230	**375**
St. James	LUTCHER, TOWN OF	104	0	0	230	**334**
St. James	ST JAMES PARISH*	0	0	0	280	**280**
St. John	ST. JOHN THE BAPTIST PARISH *	105	5	0	0	**110**

		Floodplain Management Planning	Acquisition and Relocation	Flood Protection (Elevation)	Drainage System Maintenance	**Total**
St. Tammany	MANDEVILLE, TOWN OF	112	30	0	230	**372**
St. Tammany	SLIDELL, CITY OF	104	50	0	50	**204**
St. Tammany	ST TAMMANY PARISH *	230	265	17	209	**721**
Terrebonne	HOUMA, CITY OF	126	40	0	280	**446**
Terrebonne	TERREBONNE PARISH	126	300	0	280	**706**

*Parish refers to unincorporated areas only

The communities with scores at 600 or above, indicating the highest levels of interest and activity in the flood damage reduction series are Jefferson, St. Tammany, and Terrebonne Parishes. The community scores for the Floodplain Management Plan range from 64-230. St. Tammany Parish has done the most in this area, with the only Floodplain Management Planning score above 200. While six communities have not received any credit for FMP, approximately one-third of the coastal communities score above the national average of 122 points for floodplain management planning. Most communities' scores are based on parish-wide multi-hazard mitigation plans developed since Hurricane Katrina as a prerequisite for FEMA mitigation assistance funds. Generally, such plans do not score well under the CRS criteria, which look for a more rigorous planning process and more attention to the flood hazard. St Tammany Parish's plan was prepared with the CRS in mind.

Just about all these credits for flood protection, in Louisiana and nationally, are for elevating existing buildings to reduce flood damage. Communities receive 4.2 credit points per building located in the SFHA that has been protected from flooding since the community's initial FIRM date. The buildings on the repetitive loss list receive 8.4 points. The scoring system maxes out at 84 points for large communities that cannot protect more than 2% of their floodprone buildings. Calcasieu and Jefferson Parishes have maxed out. Calcasieu Parish, Jefferson Parish, the City of Denham Springs, and St. Tammany Parish are the only communities receiving credit for flood protection, as shown in Table 6. Their scores indicate they are below the national average of 90 points on this activity, but that average includes many communities with small floodprone populations where the system allows them to receive higher scores. All the represented communities are maintaining their drainage systems except for St. John the Baptist Parish. The scores listed in Table 6 show that more than half of the Louisiana coastal communities score above this activity's national average of 201 points.

Flood Preparedness (Series 600):

- c610 (Flood Warning and Response). Objective: Provide timely identification of impending flood threats, disseminate warnings to appropriate people, and coordinate flood response activities. Max points = 255. The communities who have received credit for this activity are Calcasieu Parish, City of Gretna, Jefferson Parish, City of Harahan and City of Kenner. The national average for flood warning and response is 86 points. Jefferson Parish is the only community in coastal LA to exceed that average, with a score of 130. The communities of coastal Louisiana can improve on their ability to provide timely notice of flood threats, disseminate warnings, and have the flood response players efficiently coordinated.

Parish	Name	c610
	National average	86
Ascension	ASCENSION PARISH *	0
Ascension	GONZALES, TOWN OF	0
Ascension	SORRENTO, TOWN OF	0
Calcasieu	CALCASIEU PARISH *	44
Calcasieu	LAKE CHARLES, CITY OF	0
Jefferson	GRETNA, CITY OF	90
Jefferson	HARAHAN, CITY OF	60
Jefferson	JEFFERSON PARISH *	130
Jefferson	KENNER, CITY OF	60
Jefferson	WESTWEGO, CITY OF	0
Livingston	DENHAM SPRINGS, CITY OF	0
Livingston	FRENCH SETTLEMENT,VILLAGE	0

Parish	Name	c610
Livingston	LIVINGSTON PARISH *	0
Livingston	WALKER, TOWN OF	0
Orleans	ORLEANS PARISH	0
St. Mary	MORGAN CITY, CITY OF	0
St. Charles	ST CHARLES PARISH *	0
St. James	LUTCHER, TOWN OF	0
St. James	ST JAMES PARISH*	0
St. John	ST. JOHN THE BAPTIST PARISH *	0
St. Tammany	MANDEVILLE, TOWN OF	0
St. Tammany	SLIDELL, CITY OF	0
St. Tammany	ST TAMMANY PARISH *	0
Terrebonne	HOUMA, CITY OF	0
Terrebonne	TERREBONNE PARISH	0

Conclusion:

Coastal Louisiana is implementing programs that exceed the minimum NFIP criteria. Twenty-five communities along the coast are participating in the CRS program, and they higher than the national average in five of the activities reviewed in this paper. These communities also show high levels of interest and performance in educating residents on flood map information, conducting outreach projects, making flood protection information more readily available, providing one-on-one flood protection assistance, and maintaining drainage systems.

Sources

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Appendix I

Bibliography and Other References

Table of Contents

Given the breadth of work that must be undertaken to reduce risks for coastal residents, it is essential that policy makers and community members have access to the full range of thinking about best practices regarding nonstructural mitigation and climate change adaptation. To that end, this appendix presents publications linked to the National Hazard Mitigation Association's study, undertaken on behalf of the National Wildlife Federation and the Restore the Mississippi Coalition. This study sought to take the pulse of attitudes toward nonstructural measures and their use in coastal Louisiana.

The publications below represent the range of academic literature relevant to issues raised by the study, with an emphasis on social sciences. Annotations provide summaries of research on physical methods of hazard reduction, as well as planning, evacuation, and other programmatic options. As such, these bibliographies not only provided the theoretical underpinning for the NHMA study, they offer detailed information, from national and international sources, about strategies and methods.

General Bibliography of Academic Resources

Allens, T. (2005). Louisiana Water Resources Town Hall Meeting Report. FEMA, 1-64.

This report is from the meeting held on November 23, 2005, and discussed a brief history of Louisiana and the importance of Louisiana's natural resources. The text focused on the effects of Hurricanes *Katrina* and *Rita*, post-hurricane water recovery, and the efforts to move forward. This area is of noted importance for it provides for recreational activities, commercial, and transportation needs. The topics examined are hurricane protection, flood damage reduction, wetlands and coastal restoration, flood plain management, flood insurance, water quality recreation, and navigation and commerce. The text also outlined each organization and the tasks for which it is responsible, along with where each individual parish stood and where it was headed in restoration. It concluded that in addition to levees, specific input by each parish is needed to develop a statewide plan to assist in returning to pre-hurricane recreational and commercial activities.

Anderson, Mary (1998). Rising from the Ashes: Development Strategies In Times of Disaster. Boulder; Lynne Rienner Inc.

Armitage, Derek, Berkes, Fikret, Doubleday, Nancy (2007). Adaptive Co-Management: Collaboration, Learning and Multi-Level Governance. Vancouver; University of British Columbia.

Arneil, Barbara (2006). Diverse Communities: The Problem with Social Capital. Cambridge; Cambridge University Press.

Australian Emergency Management (AEM). Disaster Recovery 1996.

This is an important tool that deals with the community aspect of evacuation, relocation, and recovery. AEM has many excellent manuals on disaster response. AEM manuals are available at Australian Emergency Management.gov.

Avery, M. Et.al. (1981). Building United Judgment: Handbook for Consensus Making. Madison: Center for Conflict Resolution.

This book provides an excellent framework on how to collectively work together to reach a consensus and how to identify blocks that prevent a consensus from being reached. It points out how building a consensus is important for real vulnerability reduction and sustainable local capacity development.

Bankoff, G. (2003). Vulnerability as a Measure of Change in Society. International Journal of Mass Emergencies and Disasters, 21(2), 5-30.

Uses Terry Cannon's theory that hazards are natural, but disasters are not. Focused on vulnerability as a useful tool for determining how long-term adaptation to risk may not always be beneficial to a community but may instead leave individuals with further disadvantages.

Bankoff, G., Frerks, G., & Hilhorst, D. (2004). Mapping Vulnerability: Disaster, Development & People. London: Earthscan Publications.

First described, then used, vulnerability as a guide for deeming conditions of an area safe or unsafe, this book delves into areas from Africa, Asia, and Latin America.

Barry, Bryan (1997). Strategic Planning Workbook for Organizations: Revised and Updated. St Paul: Amherst H. Wilder Foundation.

This workbook gives tested practical step-by-step guidance, real life examples, and easy to use work sheets.

Barton, Thomas, Borrini-Feyerabend, de Sherbinin, Alex, and Warren, Patrizio (1997). Our People, Our Resources: Supporting Rural Communities in Participatory Action Research on Population Dynamitics and the Local Environment. Gland; The World Conservation Union

Bauman, Zigmunt(1998). Globalization: The Human Consequences. NY; Columbia University Press.

Bauman, Zygmunt (2007). Consuming Life. Cambridge: Polity Press.

Beatley, Timothy, David J. Brower, and Anna K Schwab. 1994. Introduction to Coastal Zone Management. Washington, D.C.: Island Press.

Bell, S., & Morse, S. (2003). Measuring Sustainability - Learning from Doing. London: Earthscan/James & James.

Presented advice on how to develop measurements that will work in real-life development contexts. It described and analyzed how to derive, validate and apply indicators in the course of an actual development project (as in the case of the Mediterranean Action Plan in Malta). The author explained the trade-offs and constraints involved and how it was possible to combine the open-ended and flexible prospective of sustainability with the more linear processes and fixed targets of specific projects through the use of pragmatic and reflective methodologies.

Berger, Peter L. and Thomas Luckman. 1967. *The Social Construction of Reality*. New York: Anchor Books.

Berke, P.R. (1995). Natural–Hazard Reduction and Sustainable Development: A Global Assessment. Journal of Planning Literature, 9; 370-382.

This article reviewed how the principles of sustainable development can be applied to natural-hazard reduction in developing countries. At issue is the extent to which sustainable development can be achieved through planning, and the role international aid plays in linking natural-hazard reduction to sustainable development. A conceptual framework is offered for evaluating the impacts of outside aid on long-term hazard reduction efforts (and by implication, sustainable development).

Berke, Philip R., Kartez, Jack, and Wenger, Dennis. (1993). Recovery After Disaster: Achieving Sustainable Development, Mitigation and Equity. Disaster, 17: 93-109.

This paper reviewed key findings and raised issues that are not fully addressed by the predominant disaster recovery literature of its time. Achievement of equality, mitigation and sustainable development, particularly through local participation in redevelopment planning and institutional cooperation, was the central issue of the review. Previous research and past assumptions about the process by which communities rebuild after a disaster were reviewed. A conceptual and practical significance of this model is then demonstrated by presenting case studies of local recovery experiences. Finally, conclusions on the current understanding of disaster redevelopment planning, as well as implications for public policy and future research were offered.

Berkes, F. (Eds.). (1989). Common Property Resources, Ecology and Community-Based Sustainable Development. London: Belhaven Press.

"Abstract: Involuntary population displacements and resettlement entailed by development programs have reached a magnitude and frequency that give these phenomena worldwide relevance and require policy-guided solutions. The author extracts the general trends and common characteristics revealed by a vast body of empirical data, to construct a theoretical model of displacement and reconstruction. The model captures the socioeconomic content of both segments of the process: forced displacement and reestablishment. It identifies the key risks and impoverishment processes in displacement as: (a) landlessness; (b) joblessness; (c) homelessness; (d) marginalization: (e) food insecurity; (f) loss of access to common property resources; (g) increased morbidity; (h) community disarticulation. Conversely, the model suggests that reconstructing and improving the livelihood of those displaced require risk-reversals through explicit strategies backed up by adequate financing. Flawed approaches to reconstruction and the intrinsic limitations of cost-benefit analysis are discussed. The paper shows how the proposed model can be used by practitioners and researchers as a diagnostic tool, a predictive tool, a problem-resolution tool and a research-guidance tool."

Berkes, Fikret and Folke, Carl (1998). Linking Social and Ecological Systems; Management Practices and Social Mechanisms for Building Resilience. Cambridge; Cambridge University Press.

Berkes, Fikret, Colding, Johan and Folke, Carl (2003). Navigating Social-Ecological Systems; Building Resilience for Complexity and Change. Cambridge; Cambridge University Press.

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Bolin, R. Race, Religion, and Ethnicity in Disaster Recovery 1986 University Of Colorado [see particularly pages 32-45; 102-111; 151-156].

Bolin, R. (1993). Household and Community Recovery after Earthquakes. Boulder, Co: Program on Environment and Behavior, Institute of Behavioral Science, University of Colorado, Monograph #56.

The research presented here is the result of three years of research funded by the National Science Foundation in the aftermath of the Whittier Narrows Earthquake (October 1, 1987). This project focused on the community of Whittier, California, which lies east of Los Angeles and is situated near the epicenter of the 1987 earthquake. This report focused on household and community recovery in Whittier and examined factors and issues that affected recovery processes after the earthquake. This study utilized a longitudinal research design and presented the findings of two data-collection periods approximately one year apart, beginning two years after the earthquake leveled downtown Whittier. The major focus of this research is on individual and household (family) responses to earthquakes. Research findings were also presented on the dynamics of community reconstruction and issues that emerged in Whittier over the course of the research. The primary goal in documenting community reconstruction was to identify and discuss the various issues that have affected recovery processes in Whittier.

Bossel, Hartmut (1998). Earth at a Crossroads: Paths to a Sustainable Future. Cambridge: Cambridge University Press.

Boyce, James and Shelley, Barry (Eds.). (2002). Natural Assets: Democratizing Environmental Ownership. Washington D. C.; Island Press.

Brechin, S.R., P.R. Wilshusen, C.L. Fortwangler, & P.C. West. (2003). Contested Nature: Promoting International Biodiversity with Social Justice in the Twenty-first Century. Albany: State University of New York Press.

This text contained arguments for the review of current tactics pertaining to conservationism, bio-diversity, and other such sustainable methods of resource use. It also highlighted the oppression methods used in different areas and questions the validity of allowing this to happen and how to keep it from happening.

Brown, David (2004). God and the Enchantment of Place: Reclaiming Human Experience. Oxford: Oxford University Press.

Brown, William (1999). The Ethos and the Cosmos: The Genesis of Moral Imagination in the Bible. Grand Rapids; William B. Eerdmans.

Brueggemann, Walter (2010). Journey to the Common Good. Louisville; Westminster John Knox Press.

Buckland, J. and Rahman, M. (1999). Community-based disaster management during the 1997 Red River Flood in Canada. Disasters, 1999, 23(2): 174-191.

This paper examined the relationship between preparedness and response to natural disasters and their level and pattern of community development. This was done by investigating preparation and response to the 1997 Red River Flood by three rural communities in Manitoba, Canada. The communities were selected because of their different ethnic mix and associated level and pattern of community development. The hypothesis was supported that the level and pattern of community development affect community capacity to respond to flooding. Communities characterized by higher levels of physical, human and social capital were better prepared and more effective responders to the flood. However, where the pattern of community development was characterized by high levels of social capital, decision-making processes were complicated.

Buckle, P. “A Framework for Assessing Vulnerability” The Australian Journal of Emergency Management 1995 Vol.10.

Types of loss considered include damage to infrastructure and community assets, consequences of loss, reduced capacity to manage one’s life, and significance of loss. The capacity to recover is also considered. Vulnerability is based on the notions of loss, need, and acceptable levels of risk – that is, value judgments.

Bullard, Robert D. (2007). Growing Smarter: Achieving Livable Communities, Environmental Justice, and Regional Equity. Cambridge; MIT Press.

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Artist Vita Marie Lovett's art quilt *Toro, I've a Feeling We're Not in Miami Anymore* includes debris found in her south Florida yard after Hurricane Andrew struck in 1994. She describes it as a "photo documentary of Hurricane Andrew's destruction whirling against a background of broken fabric roof trusses and window frames." It is dedicated to her friend Jackie Parker Koger who lost her life as a result of the storm, which was the costliest natural disaster in U.S. history up until that time. After the hurricane, Lovett relocated to Marietta, Georgia, where she creates art quilts with architectural themes from her home studio.

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Coastal land loss has not only been attributed to natural disasters such as hurricanes, it is also the result of man's interference. With the industrial advancements such as levee systems, canal dredging, and extraction of natural resources, such as natural gas and petroleum, humans have assisted in the drastic land loss in coastal Louisiana. This fluctuation in population can be attributed to a number of catalysts, including, but not limited to, erosion. The lack of traditional manual labor jobs like commercial fishing, boat and net construction, and employment in the oil fields people are seeking work elsewhere. This decline in population correlates with reduction in the oil industry's investment resulting in a slump in price and demand of fisheries during the 1980's.

Burleson, B. (1994) Communication of social support: Messages, interactions, relationships, and community. Thousand Oaks: Sage Pub.

This is an academic book emphasizing that communicating personal and community support are critical in disaster preparedness, response and mitigation.

Buttimer, Anne (ed.) (2001). Sustainable Landscapes and Lifeways: Scale and Appropriateness. Dublin Cork University Press.

Cadorette, Curt (1988). From the Heart of the People: The Theology of Gustavo Gutierrez. Oak Park; Myer Stone Books.

Caruth, Cathy (1995). Trauma: Explorations in Memory. Baltimore: Johns Hopkins.

Caruth's background is literature not psychology and she brings a fresh prospective to trauma. Her psychological roots seem to be Freudian. This is an important book for those with an interest in trauma and how trauma affects people's ability to make decisions. Traumatized people have trouble sorting out their experiences and planning for their future. It helps those working with disaster impacted communities understand the psychological dynamics of those impacted communities. The above book includes many important articles by a number of authors including Robert Lifton and Kai Erickson.

Caruth, Cathy (1996). Unclaimed Experience: Trauma, narrative, and history. Baltimore: Johns Hopkins Press.

The importance of 'story' and the difficulty of telling one's story and making decisions for the future are analyzed. The book helps the reader understand why survivors cannot make good decisions shortly after a traumatizing experience and why 'quick' interventions or interventions that do not take the client/stake holder's trauma and story seriously are counterproductive for long-term sustainability and resilience.

Casagrande, D. G. (n.d.). The Human Component of Urban Wetland Restoration. Interdisciplinary Restoration (pps. 254-270).

An ecological restoration can be socially and biologically beneficial. When restoring an area, employ the community to assist, they can help rebuild while gaining connectedness and a sense of success. Some approaches that would be useful in achieving a social oriented restoration are: local participation, having a focus on community, including a facilitator, educating the community, demonstrating projects, and evaluating the results. Restoration must consider more than just the physical appearance of the affected area. Additionally, it is important to have a knowledgebase on the environment in question, and to take into account the group. Examining the behaviors of the community, seeing the characteristics of that group, and noting their values can help in guiding and understanding.

Cernea, M. M. (1999). The Economics of Involuntary Resettlement: Questions and Challenges, Washington DC: The World Bank.

This text presents a broad policy and debate about reorienting the development methodologies toward social inclusion and social development by focusing on one aspect: the need to bridge the gap between economic and social knowledge in addressing population resettlement. The volume is devoted to the argument for a more direct and involved role for economics in studying the social and economic dimensions and effects of involuntary population resettlement.

Cernea, M., & McDowell, C. (2000). Risks and Reconstruction: Experiences of Resettlers and Refugees. Oxford: Berghahan Books.

This report presented a multi-dimensional comparative analysis of two large groups of the world's displaced populations: resettlers uprooted by development and refugees fleeing military conflicts or natural calamities. The book explored common central issues: the condition of being displaced, the risks of impoverishment and destitution, the rights and entitlements of those uprooted and, most importantly, the means of reconstruction of their livelihood. Part 1 set the stage for the other sections. Part 2 discussed landlessness and strategies for land-based relocation, or alternatives when land is unavailable. Part 3 explored joblessness and reemployment options for resettlers in China and the productive reintegration of a group of resettled brick makers in Argentina. Part 4 focused on urban resettlement; and provides a detailed discussion of home reconstruction by refugees. Part 5 analyzes some of the processes occurring for both resettlers and refugees, from creeping marginalization of all kinds to social re-inclusion. Part 6 analyzed the many facets of food insecurity, hunger, malnutrition, and the struggle of displaces to re-establish a sustainable food basis. Part 7 comprehensively documented the social and economic complexities of losing, maintaining, or regaining access to natural resources commonly held. Part 8 brought together the many strands that have been previously addressed.

Chambers, Robert (1983). Rural Development: Putting the Last First. Essex: Longman.

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Chiwaka, Ethlet (No date). Participatory Vulnerability Analysis: A Step-by-step Guide for Field Staff. London: Actionaid.

Christoplos, I., Mitchell, J. and Liljelund, A. (2001). Re-Framing Risk: the Changing Context of Disaster Mitigation and Preparedness. Disasters, 25(3): 185-198.

This issue of Disasters explored the roles of NGOs and other actors in disaster mitigation and preparedness and also reviewed broad international trends in risk assessment and disaster prevention. The need to address risk, and with that the motivation to improve disaster mitigation and preparedness, has tended to fall between the cracks of grander frameworks of development co-operation and humanitarian assistance. Despite the seemingly glaring need to reduce the horrific impact of floods, droughts and wars, disaster mitigation and preparedness have neither the allure of directly 'saving lives', nor of providing an 'escape from poverty'. There are, however, signs that risk management is becoming a main stream concern. Factors such as the need to address factors that do not fit into traditional slots on the relief-development continuum, the rising economic costs of disasters and growing acknowledgement that aid will never cover more than a small fraction of the costs of disasters are all leading to new approaches, priorities and institutional configurations. A realization that dealing with risk and insecurity is a central part of how poor people develop their livelihood strategies has begun to position disaster mitigation and preparedness within many poverty alleviation agendas. A number of long-standing challenges remain; most of all, the complexities of maintaining the political will that is needed to ensure that risk management becomes more than just a passing fad.

City of Jacksonville. Citizen's Disaster Preparedness Handbook. 2003.

This is a very detailed handbook. It has information on preparing to evacuate, pets and emergency supplies needed. It contains forms for personal records, addresses and phone numbers. It lists emergency phone numbers for the Jacksonville area but these can be modified for other areas.

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Comfort, L. Managing Disaster: Strategies and Policy Perspectives 1988 Duke University Press Of Models and Meanings: Cultural Resilience in Social–Ecological Systems.

Covan, E. The Impact of Hurricane Floyd in Elderly Residing in Four Southern North Carolina Counties. U of NC

Crane, Todd A. Of Models and Meanings: Cultural Resilience in Social–Ecological Systems

The objectives of this work are to: (1) highlight the importance of understanding the place of culture within social–ecological systems, (2) explore the tensions between empirical and normative positions in the analysis of social–ecological resilience, and (3) suggest how empirical modeling of social–ecological systems can synergistically interact with normative aspects of livelihoods and lifeways.

Curry, Janel and McGuire, Steven (2002). Community on Land: Community, Ecology, and Public Interest. Lanham; Rowman & Littlefield Publishers.

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Daily, Gretchen (Ed). (1997). Nature's Services: Societal Dependence on Natural Ecosystems. Washington, D.C.; Island Press.

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Daly, Herman et al (1993), Valuing the Earth: Economics, Ecology, Ethics Cambridge; MIT Press.

Daly, Herman and Cobb, John (1989). For the Common Good: Redirecting the Economy Toward Community, the Environment, and a Sustainable Future .Boston; Beacon Press.

Daniels, Ronald J., Donald F. Kettl and Howard Kunreuther (Eds.) (2006) On Risk and Disaster: Lessons from Hurricane Katrina. Philadelphia: University of Pennsylvania.

Darlington, JoAnne DeRouen and George Woodell. 2006. The Relationship between Coastal Restoration and Community Relocation: An Annotated Bibliography and Analysis of Alternative Relocation Scenarios, research report for Governor's Applied Coastal Science Program.

Deneulin, Severine and Shahani, Lila (Eds.). (2009). An Introduction to the Human Development and Capability Approach: Freedom and Agency. London; Earthscan.

Dietz, Thomas and Robert W. Rycroft. 1987. The Risk Professionals. New York: Russell Sage Foundation.

Dietz, Thomas, Paul C. Stern, and Robert W. Rycroft. 1989. "Definitions of Conflict and the Legitimation of Resources: The Case of Environmental Risk", *Sociological Forum* 4(1):47-70.

Dillman, Don A. 1999. *Mail and Internet Surveys.* NY: John Wiley & Sons, Inc.

Doka, K. (2002). Disenfranchised Grief: Direction, Challenges, and Strategies for Practice. 2nd ed. Champaign, IL: Research Press.

Doka's opinion is that the loss of this community can only be felt by those who had participated in the said community; outside groups typically do not recognize or sympathize with that loss, and this lack of understanding is the disenfranchised grief of the loss of their community. Material property (homes, automobiles, and belongings) is barely tolerated in today's society of mourning as society as a whole may not recognize grief that is not stereotypical such as death of a family member.

Dorner, Dietrich (1996). The Logic of Failure: Recognizing and Avoiding Error in Complex Systems. Reading; Preseus.

Drabek, T. Disaster Evacuation Behavior: Tourists and Other Transients 1996 Monograph No 58, University Of Colorado.

Dworkin, Ronald (1997). Taking Rights Seriously. Cambridge; Harvard University Press.

Dynes, Russell R. Preparedness Planning: The Adequacy of Assumptions about Social Organization. Journal of Japan Society of Information and Knowledge 5 (1995): 23-38.

This book classifies disasters as "social" happenings and planning to reduce the consequences of such occasions involve actions by a variety of social units. The ultimate success of such efforts depend on the adequacy in the understanding of that social base. The focus is on the local community which universally provides the materials and human resources in developing an emergency response. Several inadequate planning models are examined. Particular attention was given to the military model which views emergencies as conditions of chaos which can be rectified by command and control. A more adequate model was presented, based on conditions of continuity, coordination and cooperation. This problem-solving model provides a more adequate set of assumptions as the basis for planning, since it considers social units as resources rather than problems.

Eade, Deborah (1997). Capacity-Building: An Approach to People-Centered Development. Oxford; Oxfam.

Eade, Deborah (1996). Development and Social Diversity. Oxford; Oxfam Publications.

Eade, Deborah and Williams, S. (1995). The Oxfan Handbook of Development and Relief. 3 volumes, Oxford, Oxfam Press.

Edelstein, M.R. (1988) Contaminated Communities. Boulder: Westview Press.

This book takes an important look at technological disasters. These disasters create their own kind of dynamics and management problems. Technological disaster (and almost all disasters have technological aspects) seem to generate much more anger and resistance than 'natural' disasters.

Edwards, M. L. (1998). An Interdisciplinary Perspective on Disasters and Stress: the Promise of an Ecological Framework. Sociological Forum, 13(1): 115-132.

The main point of this work is that each field that studies disasters brings unique aspects from that field to the arena of study that, when combined, could give academia a better understanding of what actually occurs post-disaster. The fields referenced are medical-psychology, individual and social studies, psychology, sociology, anthropology, and ecology. This book focuses on the family as a key to understanding the effects of a disaster on individual stress and coping. There is a break down of each person in the family's stress and coping: children, male, female, and elderly. Discussion on how social structure and cultural factors affect reactions. Included is a debate about mental wellness counseling provisions after a disaster versus using those human resources to rebuild and distribute goods and other services.

Eldar, R. The Needs of the Elderly Persons in Natural Disasters: Observations and Recommendations. Disasters Vol.16 No 4.

Enarson, E. Responding to Domestic Violence and Disaster: Guidelines for Women's Services and Disaster Practitioners. 1997 Disaster Preparedness Resource Centre, University of British Columbia.

Enarson, E. Women, Work and Family in the 1997 Red River Flood: Ten Lessons Learned 1999 Disaster Preparedness Resource Center University of British Colombia.

Enarson, E. Women in Disasters: Conference Proceedings and Recommendations. 1998 Emergency Management Division of British Columbia.

Enarson, E. The Gender Terrain of Disasters 1998. Prager.

Enarson, E. Violence Against Women in Disasters. July 1999 Violence Against Women.

Enarson, Elaine. (2002). Building Disaster Resilient Communities: Learning from Community Women. Statement for the UN Commission for the Status of Women (46th session) panel discussion on Environmental Management and Mitigation of Natural Disaters: a Gender Perspective. Retrieved from http://www.un.org/womenwatch/daw/csw/ Csw46/panel-Enarson.pdf.

This paper focuses on women's views throughout the disaster process from warning of the disaster (if that exists) through reconstruction after the disaster. This paper dictates the methods and reasons for following the lead that women around the world have taken in assessing, preventing, and rebuilding for disasters. A discussion on learning from local women and their methods of preparedness leads to risk assessment by these women which in turn leads to methodologies from three cited areas where natural disasters are a continuous standard of life. A focus on emergency preparedness draws its resources from four women-made groups and then draws from a further three groups depicting their emergency relief efforts. Finally, from a pool of four examples, the paper expounds upon the long-term relief efforts. From these examples of women based organizations and groups there is a call to use this knowledge and turn it into action so that the knowledge from a variety of women's groups can be put into effect into areas of high risk where these groups are sadly absent.

Enarson, E. (2004). Making Risky Environment Safer: Women Building Sustainable and Disaster-Resilient Communities. Women 2000 and Beyond publication (April 2004), UN DAW. http://ww.un.org/womenwatch/daw/public/W2000.html.

This work has a both a global view and a very general discussion of gender roles in disaster prone and stricken areas. It focuses on the roles that society places upon women and how these roles affect the well-being of women and the communities housing them. It differentiates between degraded environments and natural disaster environments. General coverage of women's role in assessing risk and vulnerabilities, increasing awareness, responding to, and coping with natural disasters. It provides a general assessment of women's overall roles throughout disaster periods along with suggestions on how to capitalize on the strengths provided by those women.

EPI Guide for Emergency Managers, Planners & Responders. http://www.nod.org/assets/downloads/Guide-Emergency-Planners.html.

The National Organization on Disability encourages the use of this Guide and permits the reproduction of it in whole or in part so long as credit is properly given to The National Organization on Disability's Emergency Preparedness Initiative Guide on the Special Needs of People with Disabilities.

Erickson, Kai (1976). Everything in its Path. NY: Simon and Schuster.

This is a classic ground-breaking work that stresses the community nature of disasters and recovery as well as the social and community impact of disasters.

Esteva, Gustavo (1998). Grassroots Post-Modernism. London: Zed Books.

Eyles, John (2008). Sense of Place, Health, and Quality of Life. Hampshire; Ashgate.

Farley, Joshua, Erickson, Jon and Daly, Herman (Eds.). (2005). Ecological Economics: A Workbook for Problem-Based Learning. Washington D. C.; Island Press.

FEMA (Federal Emergency Management Agency). "Multi-hazard Mitigation Planning" and "Rehabilitation Assessment for Levees and Other Flood Control Works". www.fema.gov.

Fernandez, Eleaazar and Segovia, Fernando F. (Eds), (2001) A Dream Unfinished: Theological Reflections on America from the Margins Maryknoll, NY Orbis Books.

Fetterman, David M. Shaieh J. Kaftarian, Abraham Wandersman. (1996). Empowerment Evaluation: Knowledge and Tools for Self-Assessment and Accountability. Thousand Oaks; Sage.

Fischer, Frank. (1987). Confronting Values in Policy Analysis. Newbury Park: Sage.

Fischer, Frank. (1995). Evaluating Public Policy. Australia; Wadsworth.

Fischer, Frank (2000). Citizens, Experts, and the Environment: The Politics of Local Knowledge. Durham: Duke U Press.

Fischer, Frank. (2003). Reframing Public Policy: Discursive Politics Deliberative Practices. Oxford; Oxford Press.

Fischer, Frank. (2009). Democracy and Expertise: Reorienting Policy Inquiry. Oxford; Oxford University Press.

Fischer, Frank and Black, Michael (Eds,) (1995). Greening Environmental Policy: The Politics of a Sustainable Future. NY; St. Martin's Press.

Fischer, Frank and Maarten A. Hajer (1999). Living with Nature: Environmental Politics as Cultural Discourse. Oxford; Oxford University Press Inc.

Flora, Cornelia B. and Jan L. Flora. 2005. "Social Capital". Pp 214-227 in Challenges for Rural America in the Twenty-first Century, edited by David L. Brown and Louis E. Swanson. University Park, PA: Pennsylvania State University Press.

Franklin, Jane (Ed.). (1998). The Policies of Risk Society. Maiden; Blackwell Publishers.

Freudenburg, W. R. & Gramling, R. (1994). Oil in Troubled Waters: Perceptions, Politics, and the Battle Over Offshore Drilling. New York: State University of New York Press.

While coastal and offshore petroleum development has been welcomed in Louisiana and Texas, the expansion of development off California's coast has met with bitter opposition. This book examines how the historical, social, and physical geomorphology of the two different coast lines have affected human use patterns, vulnerabilities and acceptance or rejection of offshore petroleum activities.

Freudenburg, W. R. & Gramling, R. (1998). Linked to What? Economic Linkages and an Extractive Economy. Society and Natural Resources 11:569-586.

Coastal communities are vulnerable in many ways, not the least of which is in terms of their economic development. This article demonstrates how the growth of one extractive activity (offshore petroleum development) can come to dominate and shape a coastal region's social and economic activities while exposing the region's fortunes to the vicissitudes of the global commodity market. (See also Gramling and Freudenburg, 1990 below.)

Freudenburg, William R., Robert Gramling, Shirley Laska, and Kai T. Erikson. 2008. "Organizing Hazards, Engineering Disasters? Improving the Recognition of Politicaleconomic Factors in the Creation of Disasters. *Social Forces* 87:1015-1038.

Fullilove, Mindy Thompson (2005). Root Shock: How Tearing Up City Neighborhoods Hurts American and What We Can Do About It. NY; One World Press.

Gandhi, Leela (1998). Postcolonial Theory: A Critical Introduction. NY; Colombia University Press.

Giddens, Anthony (1990). The Consequences of Modernity. Stanford; Stanford University Press.

Gillespie, D. Partnerships in Community Preparedness. University of Colorado.

Goffman, Erving. 1974. Frame Analysis. Cambridge, MA: Harvard University Press.

Gomez, G. M. (1998). A Wetland Biography: Seasons on Louisiana's Chenier Plain. Austin: University of Texas Press.

Managing marshes and other valued habitats is a process that involves people of diverse backgrounds, interests, and goals; "recognizing the value of local knowledge is thus a first step toward acknowledging the wetland inhabitants are an integral part of the management spectrum."; landscape biography- role that stresses role of individuals shaping the landscape of impressions (ideas) and expressions (material); distinctive character of the marsh has three sources: marshland and Chenier ridges.

Government Accounting Office. 2008. "Measuring Program's Effectiveness Continues to be a Challenge". Report to the Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard, Committee on Commerce, Science, and Transportation, U.S. Senate

Goulet, Denis (1971). The Cruel Choice: A Concept in the Theory of Development. Lanhan; University Press of America.

Goulet, Denis (1989). The Uncertain Promise: Value Conflicts in Technology Transfer. NY: New Horizons Press.

Goulet, Denis (1989). Incentives for Development: The Key to Equity. NY; New Horizons Press.

Goulet, Denis (1995). Development Ethics: A Guide to Theory and Practice. London: Zed Books.

Goulet, Denis (2006). Development Ethic at Work: Explorations – 1960-2002. London; Routledge.

Gramling, R. (1996). Oil on the Edge: Offshore Development, Conflict, Gridlock. New York: State University of New York Press.

This volume is an environmental history of the gradual movement of the petroleum industry into the coastal wetlands, estuaries and bays and then offshore from the Gulf of Mexico coast, primarily Louisiana. The vulnerability of the Louisiana coast line, the interaction of the coastal geomorphology and human activities and the ways that petroleum activities have exacerbated vulnerability are also discussed.

Gramling, R. & Freudenburg, W.R. (1990). A Closer Look at 'Local Control': Communities, Commodities, and the Collapse of the Coast. Rural Sociology. 55(4): 541-558.

Coastal communities are vulnerable in many ways, not the least of which is in terms of their economic development. This article demonstrates how the growth of one extractive activity (offshore petroleum development) can come to dominate and shape a coastal region's social and economic activities and can thus expose the region's fortunes to the vicissitudes of the global commodity market. (See also Freudenburg and Gramling 1998 above.)

Gramling, R. & Freudenburg, W.R. (1996). Crude, Coppertone and the Coast: Developmental Channelization and the Constraint of Alternative Development Opportunities. Society and Natural Resources, 9:483-506.

Through a comparison of Louisiana and Florida coastal development, the analysis shows how once a particular path is taken, the development of human capital and physical infrastructure, make alternative paths increasingly less probable.

Gramling, R. & Hagelman, R. (2005). A Working Coast: People in the Louisiana Wetlands. Journal of Coastal Research, 44:112-133.

There is considerable variability in landscape across the Louisiana coastline. This article provides a primer on settlement patterns and resource use across this variability and vulnerability.

Gramling, Robert, JoAnne Darlington, George Wooddell, and Ray Brassieur. 2006. "Subsistence Use and Value: The Sharing, Distribution and Exchange of Wetland Resources among Households in Coastal Communities", project report for Gulf CREST (Coastal Restoration and Enhancement through Science and Technology).

Gregory, H. F. (1985). Saving Your Own House: Folk Culture and Mitigation. In Louisiana Folklife: A Guide to the State. Baton Rouge: Moran Colorgraphic, Inc.

By the 1970's all federally funded projects required a survey of the impact on cultural resources. Post WWII in South LA. It was noted that cultural resources include wetlands, trees and fisheries.

Gunderson, Lance H. and Holling, C. S. (2002). Panarchy: Understanding Transformations in Human and Natural Systems. Washington; Island Press.

Gupta, Akhil (1997). Culture power place: Exploitations in critical anthropology. Durham: Duke University Press.

This book addressed the importance of place in the lives of people, particularly those who have been displaced. Understanding a particular stake holder group's relation to a particular geography and history is vital for development and resilience projects.

Gutierrez, Gustavo (1984). The Power of the Poor in History. Maryknoll; Orbis.

Guyette, Susan (1983). Community-Based Research: A Handbook for Native Americans. Los Angeles; University of California.

Habel, Norman (1995). The Land is Mine: Six Biblical Land Ideologies. Minneapolis; Fortress Press.

Habel, Norman (Ed,) (2000). Readings from the Perspective of Earth. Cleveland; Pilgrim Press.

Habel, Norman and Wurst, Shirley (Eds,) (2001). The Earth in Wisdom Traditions. Cleveland; Pilgrim Press.

Habel, Norman (Ed) (2001). The Earth in the Psalms and the Prophets. Cleveland; The Pilgrim Press.

Habel, Norman (Ed) (2002). The Earth Story in the New Testament, Cleveland; The Pilgrim Press.

Habel, Norman (Ed). The Earth Story in Genesis. Cleveland; The Pilgrim Press.

Haenn, Nora and Wilk, Richard (Eds.). (2006). The Environment in Anthropology: A Reader in Ecology, Culture, and Sustainable Living. NY; New York University.

Hamington, Maurice. (2004). Embodied Care: Jane Addams, Maurice Merleau-Ponty, and Feminist Ethics. Urbana; University of Illinois Press.

Hansen, A and A. Oliver-Smith 1982. Involuntary Migration and Resettlement: The Problems and Responses of Dislocated Peoples**.**

Harrison, David M., Smersh, Greg T. & Schwartz, Arthur L., Jr. (2001). Environmental determinants of housing prices: the impact of flood zone status. Journal of Real Estate Research, 21(1/2):3-20.

This article is the winner of the real estate valuation manuscript prize (sponsored by The Appraisal Institute) presented at the 2000 American Real Estate Society Annual Meeting. This study examined the valuation of homes located within 100-year flood plains. Utilizing a database of 29,887 property transactions in Alachua County, Florida, the results of this investigation suggest that comparable characteristic homes located outside flood zones. Interestingly, the price differential is less than the present value of future flood insurance premiums. In addition, the price differential is shown to have increased since passage of the National Flood Insurance Reform Act of 1994. Finally, it appears that property tax assessors have slightly over assessed properties located in flood zones relative to those in other areas. The large database and the lengthy period of analysis (1980-1997) are much broader than that of previous research efforts.

Harvey, David (1990). The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change. Oxford; Blackwell.

Harvey, David (1996). Justice, Nature and the Geography of Difference Oxford; Blackwell.

The H. John Heinz III Center for Science, Economics and the Environment (2002). Human Links to Coastal Disasters. Washington.

This text examines human vulnerability in reference to the issues of the coast; furthermore, in the vulnerability of these areas public and private support is considered. The importance of education, both in preparation for a disaster and in the aftermath, are taken seriously and current programs are noted. This document provides a number of excellent charts detailing the individual topics addressed including the physical and psychological effect of a disaster. One aspect that is considered is the community perception and the groups that are the most at risk of mental health problems. The work concludes that women and children are considered at risk, but the article expounds further on the differences in gender and the role women play pre- and post- disaster. This article is extremely individual and community centered, even with the discussion revolving around politics and policies.

Held, Virginia (1984). Rights and Goods: Justifying Social Action. Chicago; University of Chicago Press.

Heller, P. Proactive Hurricane Response Emphasized. Disaster Response News Network 10/8/1998.

Henstra, Dan, Paul Kovacs, Gordon McBean, Paul Sweeting. 2008. "Background Paper on Disaster Resilient Cities", report prepared for Infrastructure Canada, Government of Canada.

Hershman, Marc J., James W. Good, Tina Bernd-Cohen, Robert F. Goodwin, and Virginia Lee Pam Pogue. 1999. "The Effectiveness of Coastal Zone Management in the United States." Coastal Management 27:113-138.

Hinchman, Lewis (2001). Memory, Identity, Community; The Idea of Narrative in the Human Sciences. Albany; State University of NY.

Hinsdale, Mary Ann (1995), It Comes from the People: Community Development and Local Theology. Philadelphia; Temple University Press.

Holland, Jeremy and Blackburn, James (Eds.) (1998). Whose Voice? Participatory Research and Policy Change. London; ITP.

Holland, Jeremy and Blackburn, James (Eds.) (1998). Who Changes?: Institutionalizing Participation in Development. London; ITP.

Hope, Anne and Timmel, Sally (1984, 1994). Training for Transformation: A Handbook for Community Workers. (4 volumes) London; ITGD Publications.

Horton, Myles and Freire, Paulo (1990). We Make the Road by Walking: Conversations on Education and Social Change. Philadelphia: Temple University Press.

Hufford, Mary (Ed.). (1994). Conserving Culture: A New Discourse on Heritage. Urbana; University of Illinois Press.

"Hurricane Georges Assessment: Review of Hurricane Evacuation Studies Unionization and Information Dissemination" U.S. Army Corps of Engineers. 1999.

- Ch. 3 Behavioral Analysis-Public Response in Georges: Telephone interviews of "approximately 800 residents ranging from Louisiana through the Florida Keys." There were 206 respondents in LA, 193 in MS, 99 in AL, 106 in Northwest FL, and 208 in the Lower Keysa FL (pg 3-1).
- "In all survey locations, except NW Florida, more than half of those interviewed said they left their homes to go someplace safer. However, the participation rates were only slightly more than 50%, ranging from 54% in LA to 67% in AL. In NW Florida only 22% evacuated their homes.
- Those who did not evacuate were asked if they would have eventually left if they had been convinced that Georges was going to strike more directly. Roughly half said they would have left in that case.
- Concern about the severity of the storm was the most frequently mentioned factor in each location" as to what convinced them to go someplace safer. The percentage would have been higher if other response categories dealing with concern about flooding and wind were included. Advice or appeals from others were mentioned in every survey location, but in some places (NW FL, MS and Keys) notices from officials were most prominent. In other places (AL, LA) appeals from friends and relatives were cited more often.
- Most of the people who did not evacuate said they did not think the storm strong enough to pose a threat to their safety, given their home's construction and location.
- COMPLACENCY-Asked if they would do anything differently, given the situation in the future, "In the Keys, 43% of those who did not evacuate in Georges said they would do so if faced with the situation again. 23% gave that response in MS, but in LA and NW FL fewer said they would leave in the future.
- The survey also includes a question about evacuation destinations, finding that few evacuees sought refuge in their own neighborhoods. In most locations only 12% to 18% did some and in NW FL, only 4% did so. In LA, 23% said they went someplace in their own neighborhood.
- In both LA and the Florida Keys, numerous "evacuees" stayed in the county, either in their own neighborhoods or elsewhere in their parish or county.

Hutton, D., & Haque, C. E. (2004). Human vulnerability, dislocation and Resettlement: adaptation process of river-bank erosion-induced displaces in Bangladesh. Disasters, 28(1), 41-62.

In Bangladesh, the relocation of the people was strictly involuntary and a result of riverbank erosion and flooding. These involuntary evacuees remained close to home for a variety of reasons including, but not limited to: "…lack of economic affordability to move to urban areas, to avoid uncertainty in unfamiliar urban environment and not to lose the advantages of being part of a larger social network in rural area, and the hope of regaining charland in the future (p. 46)." Some evacuees who lost everything were forced to move to urban areas to provide basic necessities for their families. The results of relocation affected the daily rituals of the women (a focus in the study) to a point of "eroding basic practices (p. 50)" of the prayer ceremonies. This is a cultural trait and without the support from their communities these women began to change their habits to more easily assimilate into their new surroundings. This change of habit is a small, yet significant change in culture that could eventually lead to cultural extinction.

Isbister, John (2003). Promises not Kept: Poverty and the Betrayal of Third World Development. Bloomfield; Kumarian Press.

Jennings, James (Ed). (2007). Race, Neighborhoods, and the Misuse of Social Capital. NY; Macmillan Pub.

Johnson, Bruce (1982). Redesigning rural development: A strategic perspective. Baltimore: Johns Hopkins.

Development is always a factor in disasters and in hazard mitigation planning. Poor development, which is any development that does not take natural and technological hazards and human vulnerability into account, is the leading cause of disasters. Development that incorporates risk assessment and reductions and disaster mitigation that is sensitive to sustainable livelihood development are what we need today. This book is one of a growing number of books on urban and rural development that is taking vulnerability reduction and local sustainable development seriously.

Kates, Robert W., C.E. Colten, S. Laska and S.P. Leatherman. 2007. "Reconstruction of New Orleans after Hurricane Katrina: A Research Perspective", Cityscape 9(3).

Kaufman, Michael and Alfonso, Haroldo (Eds.). (1997). Community Power and Grassroots Democracy: Transformation of Social Life. London; Zed Books.

Killijanek, T. "Assessing Long-term Impacts of A Natural Disaster: A Focus on the Elderly" The Gerontologist 1979 Vol. 19 No.6.

Kirsch, Stuart (2006). Reverse Anthropology: Indigenous Analysis of Social and Environmental Relations in New Guinea. Stanford; Stanford University Press.

Krogman, Naomi. 1996. "Frame Disputes in Environmental Controversies: The Case of Wetland regulations in Louisiana." Sociological Spectrum 16(4):371-400.

Krueger, Rob and Gibbs, David. (2007). The Sustainable Development Paradox: Urban Political Economy in the United States and Europe. NY; Guilford Press.

Krumholz, Norman and Forester, John (1990). Making Equity Planning Work: Leadership in the Public Sector. Philadelphia: temple University Press.

Lefebvre, Henri (1991). The Production of Space. Oxford; Blackwell Books.

Lindell, Michael K. (ed.). 1997. "Adoption and Implementation of Hazard Adjustments." International Journal of Mass Emergencies and Disasters 15(3):327-338.

Lindell, Michael K, Carla Prater and Ronald W. Perry. 2007. Introduction to Emergency Management. Hoboken, NJ: John Wiley & Sons, Inc.

Long, Carolyn (2001). Participation of the Poor in Development Initiatives: Taking Their Rightful Place. London: Earthscan.

Louisiana Department of Natural Resources. "Coastal Restoration and Management Division."

Louisiana Geographic Information Center, (2005). 2005 Louisiana Hurricane Impact Atlas. 2005 Louisiana Hurricane Impact Atlas, 1, 1-39.

This text outlines, separately, the following facts about Hurricane Katrina and Rita: the storms' history, storm impact, maximum sustained winds, wind gust, rainfall, storm surge, flooding, levees breached, damage estimates, and where the displaced people are located. The text also looks at federal assistance, economic problems, and the employment on a parish-by-parish basis. Interestingly, unlike many other text examined, the atlas also explores what is occurring on a household basis (including poverty stricken households), what homes have children under 18, and the schools that were closed.

Lui, Amy and Allison Plyer. 2008. The New Orleans Index Anniversary Edition: Three Years After Katrina. Washington, DC: The Metropolitan Policy Program at Brookings.

Lukas, Carol (1996). Consulting with nonprofits: A practitioner's guide. St Paul: Amherst H. Wilder Foundation.

A comprehensive guide to working with nonprofits and community groups.

Maguire, Brigit and Patrick Hagan. 2007. "Disasters and Communities: Understanding Social Resilience." Australian Journal of Emergency Management, 22(2):16 – 20.

Maida, Carl (Ed.). (2007). Sustainability and Communities of Place. NY; Berghahn Books.

Malpas, J. E. (1999). Place and Experience: A Philosophical Topography. Cambridge; Cambridge University Press.

Marris, P. (1974). Loss and change. New York: Pantheon Books.

Relocated communities many experience loss and may not be allowed to mourn the passage of their prior lives and/or environment.

Marsden, David (1990). Evaluating social development projects. Oxford: Oxfam.

A manual on development. Oxfam produces great materials. This is a good handbook on evaluation because it looks at human factors and not just numbers.

Marx, Gary T. and Douglas McAdam. 1994. Collective Behavior and Social Movements: Process and Structure. Englewoods Cliffs, NJ: Prentice-Hall.

Maskrey Andrew (1989). Disaster mitigation; A community based approach. Oxford: Oxfam.

A manual on involving local communities in sustainable mitigation and resilience. Community approaches, generally are important in recovery. This is particularly true for mitigation which to be really successful must be accomplished regionally.

May, Peter J. and Walter Williams. 1986. Disaster Policy Implementation: managing programs under shared governance. New York Plenum Press.

May, Peter J. 1993. "Mandate design and implementation", Journal of Policy Analysis and Management 12 (4): 634-663.

Mayerfeld, Jamie (1999). Suffering and Moral Responsibility. Oxford: Oxford Univ. Press.

Max-Neef, (1991). Human Scale Development: Conception, Application and Further Reflections. NY: Apex Press.

McCarthy, John D. and Mayer N. Zald. 1977. "Resource Mobilization and Social Movements: A Partial Theory", *AJS* 82:1212-1241.

McDowell, C. (Eds.). Understanding Impoverishment: The Consequences of Development Induced Displacement, (pp.77-98). Providence and London: Berghahn Books.

This text raises many questions as to the validity of the actual progress and development that has occurred in the late twentieth century. It highlights the problems and effects of this so-called evolution in processes of displacement. Is the price of development worth the cost? Is it really development if somewhere else there are detrimental effects? This text brings to light the seriousness of the situation.

McEntire, D. A. & Myers, A. (2004). Disaster Prevention and Management: Preparing communities for disasters: issues and processes for government readiness., 13(2):140-152.
This paper discusses what local governments must do to prepare for various disasters, including terrorist attacks. It provides background information on preparedness and highlights lessons from prior research. It also identifies the process of establishing local ordinances, assessing risk, creating emergency operations plans, acquiring resources, instituting mutual aid agreements, training, exercising and educating the public. Finally, it concludes with recommendations to implement these preparedness measures.

McFague, Sallie (1993). The Body of God: An Ecological Theology. Minn: Augsburg Fortress.

McGaa, Ed and Eagle Man (2004). Nature's Way: Native Wisdom for Living in Balance with the Earth. NY; HarperOne.

McIntyre-Mills, Janet Critical Systemic Praxis for Social and Environmental Justice: Participatory Policy Design and Governance for a Global Age. NY: Plenum Publishers.

McKenzie-Mohr, Doug ND, Smith, William (1999). Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing. Gabriola Island; New Society Publishers.

McLaren, Peter and Jaramillo, Nathalia (2007). Pedagogy and Praxis in the Age of Empire. Rotterdam; Sense Publishers.

Meadows, Donella, Meadows, Dennis and Randers, Jergen (Eds.). Beyond the Limits: Confronting Global Collapse, Envisioning a Sustainable Future. Port Mills: Chelsea Green Publishing.

Medina, Martin (2007). The World's Scavengers: Salvaging for Sustainable Consumption and Production. Lanham: AltaMira.

Merchant, Carolyn (1980). The Death of Nature: Women, Ecology and the Scientific Revolution. NY; Harper & Row.

Mihesuah, Devon (2003). Indigenous American Women: Decolonization, Empowerment, Activism. Lincoln: University of Nebraska Press.

Mihesuah, Devon (2004). Indigenizing the Academy: Transforming Scholarship and Empowering Communities. Lincoln; University of Nebraska Press.

Mileti, D. S. and J. H. Sorensen. Communication of Emergency Public Warnings: A Social Science Perspective and State-of-the-Art Assessment. 1990 Colorado State University. FEMA.

This paper is the classic on warning systems. The research finds that there are several steps that people go through in the warning. The paper goes into detail on the sending/receiving process.

Mileti, D. Disasters by Design: A Reassessment of Natural Hazards In The United States. 1999 Joseph Henry Press.

Miller Fiona, et al. Resilience and Vulnerability: Complementary or Conflicting Concepts? 2010. http://www.ecologyandsociety.org/vol15/iss3/art11/

Resilience and vulnerability represent two related yet different approaches to understanding the response of systems and actors to change; to shocks and surprises, as well as slow creeping changes. Their respective origins in ecological and social theory largely explain the continuing differences in approach to social-ecological dimensions of change. However, there are many areas of strong convergence. This paper explores the emerging linkages and complementarities between the concepts of resilience and vulnerability to identify areas of synergy. This is done with regards to theory, methodology, and application. The paper seeks to go beyond just recognizing the complementarities between the two approaches and demonstrates how researchers are actively engaging with each field to coproduce new knowledge, and to suggest promising areas of complementarity that are likely to further research and action in the field.

Mohr, Doug (1999). Fostering sustainable behavior: An introduction to community-based social marketing. Gabriola B.C.: New Society Pub.

Sustainability and resiliency are in the final analysis concrete behaviors. This is a good book to begin a study of sustainable development. Understanding mitigation and resilient communities in terms of sustainable development is a necessary skill for those who are serious about providing helpful service to recovering and at risk communities. This is a practical methods book with good basic theory and key elements and process for introducing sustainable behaviors.

Morrow, B. “Identifying and Mapping Vulnerability” Disasters 1999 Vol 23 No.1.

Disaster vulnerability is socially constructed, i.e., it arises out of the social and economic circumstances of everyday living. Most often discussed from the perspective of developing nations, this article extends the argument using American demographic trends. Examples from recent disasters, Hurricane Andrew in particular, illustrate how certain categories of people, such as the poor, the elderly, women-headed households and recent residents, are at greater risk throughout the disaster response process. Knowledge of where these groups are concentrated within communities and the general nature of their circumstances is an important step towards effective emergency management. Emergency planners, policy-makers and responding organizations are encouraged to identify and locate high-risk sectors on Community Vulnerability Maps, integrating this information into GIS systems where feasible. Effective disaster management calls for aggressively involving these neighborhoods and groups at all levels of planning and response, as well as mitigation efforts that address the root causes of vulnerability.

Mugerauer, Robert (1994). Interpretations on Behalf of Place: Environmental Displacements and Alternative Responses. Albany; State University of NY.

Mugerauer, Robert (1995). Interpreting Environments: Tradition, Deconstruction, Hermeneutics. Austin; University of Texas.

Mugerauer, Robert and Manzo, Lynne (2008). Environmental Dilemmas: Ethical Decision Making. London; Lexington Books.

Mustafa, Danish. 2007. "Reinforcing Vulnerability? Disaster Relief, recovery. And response to the2001 flood in Rawalpindi, Pakistan", Global Environmental Change Part B: Environmental Hazards 5(3 – 4): 71-82.

Nakagawa, Y., & Shaw, R. (2004). Social capital: a missing link to disaster recovery. International Journal of mass emergencies and disasters, 22(1), 5-34.

Delves into the prospect that in Kobe, Japan in a post-earthquake rebuilding process the community participated in the rebuilding and had a perceived higher and faster rebound rate. The model derived from that disaster was used in Gujarat, India when there was a similar earthquake disaster with a need to rebuild. The model was also used in four different communities, and it was observed that the communities with the highest social capital had the highest satisfaction rates for new town planning and the speediest recoveries. Discussion of what constitutes social capital, along with the roles of community leaders, are examined with intense detail. The conclusion dictates the uses of social capital and their value to post-disaster recovery.

Narayan, Uma. (1997). Dislocating Cultures: Identities, Traditions, and Third World Feminism. NY; Routledge Press.

National Research Council (2005). Valuing Ecosystem Services: Toward Better Environmental Decision- Making. Washington, D. C.; The National Academies Press.

Neal, David M. Types and Functions of Umbrella Organizations for Local Social Movement Organizations: A Look at Emergent Citizen Groups in Disasters. Sociological Research Symposium XIII, ed. By Marie Larkin, Julie A. Honnold, and J. Sherwood Williams (Richmond, VA: Department of Sociology, Virginia Commonwealth University, 1983): 119-122.

We attempt to look at the local and community/regional levels of social movement organizations (SMO) and the relationship between them in regards to resource distribution. We hope to ascertain how local SMO's such as emergent citizen groups, receive resources.

Neal, D. "Effective Emergency Management: Reconsidering the Bureaucratic Model" Disasters Vol.19 No 9 Dec 1995.

Neal suggests that the command and control model leads to ineffective emergency response. Flexible organization configurations are suggested.

Newman, Peter and Jennings, Isabella (2008). Cities as Sustainable Ecosystems: Principles and Practices. Washington; Island Press.

Newport, J. K. & Jawahar, G. G. P. (2003). Community participation and public awareness in disaster mitigation. Disaster Prevention and Management, 12(1):33-36. (2b).

Describes how the Society for National Integration through Rural Development in India involves the local communities when developing disaster mitigation measures. Shows how participation of the community in resource identification, capabilities, coping mechanisms and vulnerability assessment will be more effective in the planning of a sensible and practical system, more suitable for the needs of the community. It also covers contingency planning, community preparedness, task forces (comprising active youths in the ratio of one youth for ten families), and response mechanisms.

Nigg, Joanne M. Disaster Recovery as a Social Process. Wellington After the Quake: The Challenge of Rebuilding (Wellington, New Zealand: The Earthquake Commission, 1995): 81-92.

This paper takes the perspective that recovery from disaster is not merely concerned with the reestablishment on the physical or built environment; that is, community recovery should not be conceptualized as an outcome, but rather as a social process that begins before a disaster occurs and encompasses decision-making concerning emergency response, restoration and reconstruction activities following the disaster. Put another way, reconstruction is less a technical problem than it is a social one. In order for successful post-disaster decisions to be made, however, there must be an awareness of the pre-disaster conditions that create situations of social and structural vulnerability, putting some segments of the society at greater risk in the event of an earthquake than others. From this perspective, what becomes important is how those decisions are made, who is involved in the decision-making, what consequences those decisions have on the social groups within the disaster-stricken communities, and who benefits from these decisions and who does not.

Nigg, J. The Social Impact of Extreme Physical Events, U of Del.

Nored, Ron (1999). Renewing the Fabric: How Congregations and Communities Come Together To Build Their Neighborhoods. Montgomery, Black Belt Press.

Norris-Raynbird, Carla (2011). Local CZM Capacity Pre and Post Katrina, Rita, Gustav, and Ike: A Comparison Study. Louisiana Sea Grant College Program.

The hurricane events that continue since 2005 bring into critical focus the need to assess how best to provide the necessary tools to build knowledge and local capacities to manage the needs of present and future coastal Louisiana challenges. In this study, capacity is defined as agreement with regulator ideology that undergirds policy and regulation promulgated by Louisiana Department of Natural Resources. Designed as a

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Comparisons of the 2005 and 2011 data show that there has been a shift in ideological framing that moves the 2011 cohort of respondents further away from agreement with regulatory ideology. As expected, all respondents perceived high risk associated with hurricanes, surge and flooding, but three factors are found to influence perception of greater risk, specifically 'regulator frame', 'having an LCP' and 'proximity to coast'. In 2011 there is greater awareness of the how weather events translate into extended economic vulnerabilities from infrastructure damage, business interruption, loss of investment capital and property loss. Of all mitigation strategies presented, respondents overwhelmingly indicate that voluntary inland relocation is the least relevant mitigation strategy to their parish. Regardless of coastal or inland location, most parishes indicate reliance on large scale technological/engineered strategies (structural mitigation such as levees and flood control devices or non-structural mitigation such as wetlands restoration). Less support was found for regulatory mitigation strategies. For elevation requirements currently mandated by the state, parishes have adopted one of three strategies: 'stall tactics', 'enforcer strategy', and 'soft compliance – team effort'.

Norris-Raynbird, Carla. 2006. "Capacity-building: An inquiry into the Local Coastal Program component of coastal zone management in Louisiana." PhD dissertation, Department of Sociology, Texas A&M University.

Norris-Raynbird, Carla. 2008. "The Use of Frames Analysis in Evaluating Capacity-building in Local Coastal Programs in Louisiana," Rural Sociology 73(1):22-43.

Nussbaum, Martha (2000). Women and Human: The Capabilities Approach. Cambridge; Cambridge University Press.

Nussbaum, Martha and Sen. Amartya. (Eds.). (1993). The Quality of Life. NY; Oxford University Press.

Oliver-Smith, A. (n.d.). Communities after catastrophe: reconstructing the material, reconstituting the social. 1-18. Reconstituting Communities.

Communities have a shared past, and they have a similar understanding of values, practices, history, and identity and a certain framework. Communities which have been displaced typically long for what was, when they needs to focus on what could be. The rituals of mourning, community recovery through commemoration of the loss, should be a tangible item they can hold onto (rituals). This text shows the role of anthropology as it shows in the past present and future, a focus on cultural resources, the power of cultural tradition to mobilize people facing the destruction of their community.

Oliver-Smith, A., (1996). Fighting for a place: the policy implications of resistance to resettlement. In McDowell, C. (Eds.). Understanding Impoverishment: The Consequences of Development Induced Displacement, (pp.77-98). Providence and London: Berghahn Books.

This text raises many questions as to the validity of the actual progress and development that has occurred in the late twentieth century. It highlights the problems and effects of this so-called evolution in processes of displacement. Is the price of development worth the cost? Is it really development if somewhere else there are detrimental effects? This text brings to light the seriousness of the situation.

Olson, R. S. (2000). Toward a Politics of Disaster: Losses, Values, Agendas, and Blame. International Journal of Mass Emergencies and Disasters (IJMED), 18(2):265-27. (2d).

Offering exemplars from around the world, including China, Mexico, Nicaragua, and California, this paper argues that disasters must be understood and analyzed more deeply and more often as explicitly political events. The paper also argues that because politics is the "authoritative allocation of values." The politics-disaster nexus revolves around the allocation of several important values: life safety in the pre-event period, survival in the emergency phase, and "life chances" in the recovery and reconstruction periods. The paper concludes by suggesting that the literatures on agenda control and causal stories/blame management are particularly useful points of departure for analyzing disasters as intrinsically political events.

O'Neill, John (1993). Ecology, Policy, and Politics: Human Well-Being and the Natural World. London; Routledge.

Padgett, H. R. (1963). The sea fisheries of the southern united states: retrospect and prospect. Geographical Review, 53(1): 22-39.

This offers a historical look at the southern fishing industry. For the coast, fishing has come last and is the most neglected of the area's many resources. The author raises the question, "Why is this resource and the people who make this their livelihood, in a low status?" In the 1800's, fisheries were based on a local level with the use of small boat to get their catch. The booming product of this time was salt fish and, though New Orleans had the largest local market, there were problems. Agriculture began to take shape and resulted in a decline in fisheries, and there were hindrances with the market due to competition and the problem with keeping the seafood from spoiling. Things picked up when shipping by air became possible. Today (in the 1960's) the coasts seafood industry has a number of factors going for it like the quality and taste of the product, but there has still been a decline in fisheries. Today's problems involve "…lack of government to trade association inspection to ensure quality and standard size, difficulties concerning credit and insurance for fishermen, a general public unfamiliarity with fish (the multiplicity of kinds, unstandardized common names, and ignorance of seasons of abundance lead to deception by unscrupulous dealers), and noticeable lack of the scientific research, technical efficiency, and expert management and salesmanship that are necessary to meet competition (P.35)."

Padgett, H. R. (1969). Physical and cultural associations on the Louisiana coast. Annals of The Association of American Geographers, 59(3): 481-493.

Noting a real and potential change that will take place as the new takes hold of the traditional ways of life to yield progress. Padgett discusses how coastal Louisiana has changed at a slower rate than most areas. He examines coastal Louisiana and its port but concentrates on New Orleans and Morgan City. Padgett explains how with continual change cultures are moving away from the environment especially with the drastic amount of technological advancement. Traditional labor of coastal Louisiana is changing from mainly familial to commercial fishing and trapping to including work in the oil industry. The shift in labor is not the only element that is changing the unique lands; the pollution and pesticides used by industries is threatening aquatic life and resulting in dead streams. As jobs come available in industries more family members are moving away from labors like commercial fishing into more financially beneficial jobs similar to petroleum production.

Parkes, Colin and Stevenson-Hinde, Joan (Eds.). 1982. The Place of Attachment in Human Behavior. NY; Basic Books.

Paton, D., Smith, L. & Violanti, J. (2000). Disaster response: risk, vulnerability and resilience, Disaster Prevention and Management, 9(3):173-179.

The assumption of an automatic link between disaster exposure and pathological outcomes is increasingly being questioned. Recognition of the possibility of positive reactions and growth outcomes in this context necessitates the development of alternative models and, in particular, the accommodations of the resilience construct in research and intervention agenda. This book reviews possible vulnerability and resilience factors and adopts a risk management framework to outline its potential for modeling the complex relationships between these variables and both growth and distress outcomes. Resilience and vulnerability is discussed at dispositional, cognitive and organizational levels. The paradigm developed here focuses attention on facilitating recovery and growth in professionals for whom disaster work and its consequences is an occupational reality.

Paton, Douglas and Johnston, David (2006). Disaster Resilience: An Integrated Approach. Springfield Charles Thomas Publishers.

Peacock, W. (1993**).** Living Conditions, Disasters, and Development: An Approach to Cross-Cultural Comparisons. Athens: University of Georgia.

Peacock, Walter Community as an Ecological Field: A Potential Contribution from Disaster Research and Theory. National Hurricane Center.

Sociologists involved in urban and community research tend to, implicitly or explicitly, view communities as single integrated social systems. From this perspective, communities experiencing high impact disasters are viewed as being in a state of disorganization. Recovery in this context implies the reestablishing of the organizational integrity of the system. This paper offers an alternative perspective of community as an ecological field and then reinterprets the notions of disaster and recovery from this perspective of community as an ecological field. It also calls for the development of a socio-political ecological community perspective. Discussions will draw from recent research conducted following Hurricane Andrew in Metropolitan Dade County, Florida.

Peacock, W. Hurricane Andrew: Ethnicity, Gender and the Sociology of Disasters (1997) Rutledge.

There is an important chapter on the dislocation of survivors and the problems of the "tent cities."

Peacock, W. G., Brody, S.D., & Highfield, W. (2005). Hurricane Risk Perceptions among Florida's Single Family Homeowners. Landscape and Urban Planning.

Hurricane and associated damage remains a constant threat to the health, safety and welfare of residents in Florida. Hurricane risk perception has been found to be an important predictor of storm preparation, evacuation, and hazard adjustments undertaken by households, such as shutter usage. Planners and policy makers often employ expert risk analysis to justify hazard mitigation policies, yet expert and lay risk assessments do not always agree. This article examines factors contributing to hurricane risk perception of single-family homeowners in Florida. Utilizing data from a statewide survey, the authors first map and spatially analyze risk perceptions throughout Florida. Second, they examine the influence of location on shaping homeowner perceptions along with other factors such as knowledge of hurricane, previous hurricane experience, and socio-economic and demographic characteristics. The findings suggest there is a good deal of consistency between residing in a location identified by experts as being high hurricane wind damage, why these are and were the most susceptible, what social factors influence ones ability to leave, and what groups end up with the least assists in the wake of Hurricane Andrew. The authors find that minorities are the ones that fall heavily in the above state groups, especially African Americans. Gender is also examined; women have a huge role in pre- and post- disaster issues like leaving and rebuilding. Women are also a group largely at risk to the above stated vulnerabilities (particularly minority females). Kinship and community ties are also taken into account, along with coping strategies of all list groups. The media promotes the mindset that all are affected by disasters instead of the most vulnerable economic status. This status typically determines who gains and who losses, there exists uneven recovery patterns, and their temporary coping strategies.

Pelling, Mark (2003). The Vulnerability of Cities: Natural Disasters and Social Resilience.London: Earthscan Pub.

Pelling, Mark (Ed.). (2003). Natural Disasters and Development in a Globalizing World. London; Routledge Press.

Phillips, B. The Elderly and Disaster; General Research Finding (courtesy of Dr. Cheryl Childers) Texas Women's University.

Pig, Kenneth E. and Ted K. Bradshaw. 2005. "Catalytic Community Development: A Theory of Practice for Changing Rural Society." Pp 385-396 in Challenges for Rural America in the Twenty-first Century, edited by David L. Brown and Louis E Swanson. University Park, PA: Pennsylvania State University Press.

Plowman, Terry. "Danger! Hurricane Coming" 2001. Planning. 67 (December): 16-21.

- This article talks about Hurricane Floyd, and how it was the "largest evacuation in U.S. history." (Georges was the largest evacuation before Floyd.)
- The article points out that the heart of the evacuation problem is the fact that the population of coastal communities is growing at a faster rate than the nation as a whole. "Our coastal populations are exploding, but our road infrastructure to support those populations has not."
- A "lull in hurricane activity over the past several decades may make new residents complacent."
- Emergency Managers used to worry that too few people would respond to evacuation warnings; now they worry about too many people hitting the road unnecessarily.
- "Behavioral studies show that people will tolerate traffic delays if they are better informed," says Bob Collins. "We don't want people driving blind. We need to tell them where shelters are available and give them useful traffic information."

Pound, Barry, Snapp, Sieglinde, McDougall, Cynthia: Braun, Ann (2003). Managing Natural Resources for Sustainable Livelihoods: Uniting Science and Participation. London: Earthscan.

The development and management of sustainable developments and resilience has a better chance of being successful when there are real partnerships between local people and external agencies. Drawing on extensive and relevant case studies this book presents innovative approaches for establishing and sustaining participation and collective decision-making, good practice for research and challenges for future development. This volume also has over 20 case studies.

Power, Thomas (1996). Lost Landscapes and Failed Economics: The Search for A Value of Place. Washington, D.C.; Island Press.

Pratt, Brian (1990). The Field Director's Handbook: Oxfam Manual for Development Workers. Oxford U. Press.

Prell, Christina, Mark Reed, Liat Racin, and Klaus Hubacek. Competing Structure, Competing Views: The Role of Formal and Informal Social Structures in Shaping Stakeholder Perceptions. *Ecology and Society* 15(4):34. : http://www.ecologyandsociety.org/vol15/iss4/art34/

What is social structure, and how does it influence the views and behaviors of land managers? In this paper, we unpack the term "social structure" in the context of current research on institutions, social networks, and their role(s) in resource management. We identify two different kinds of structure, formal and informal, and explore how these link to views of land management and management practice. Formal structures refer to intentionally designed organizations that arise out of larger institutional arrangements; informal ones refer to social networks, based on the communication contacts individuals possess. Our findings show significant correlations between respondents' views regarding land management and their social networks; it is these informal structures that have greater influence on what stakeholders perceive. These findings suggest that stakeholders are less influenced by their particular organizational affiliation or category (e.g., "conservationist" versus "farmer"), and more by whom they speak with on a regular basis regarding land management. We conclude with a discussion on the practical implications for resource managers wishing to "design" participatory management, arguing that, if "diversity" is the goal in designing such participatory processes, then diversity needs to translate beyond stakeholder categories to include consideration for the personal, social networks surrounding stakeholders.

Quarantelli, E. L. General and Particular Observation on Sheltering and Housing in American Disasters. Disaster 6 (1982) 277-281 U of Del.

After a survey of the English language social science literature and a review of several case histories, the Disaster Research center compiled a number of observations on sheltering and housing following sudden onset disasters which are summarized in this text. The study is aimed at increasing our knowledge of American peace-time disasters. The four different phases, emergency and temporary sheltering and emergency and temporary housing are defined and discussed. There seems to be little disaster planning and often the co-ordination of relief efforts is inefficient. It appears that communities could be better informed and that more research is necessary in order to understand and evaluate these phenomena properly. The paper points to areas which could be usefully investigated.

Quarantelli, E. L. The Preparation of Citizen Groups for Earthquakes: The Atypical Nature of Such Groups and the Conditions for Their Emergence. Proceedings of the Eight World Conference on Earthquake Engineering Volume 7 (Englewood Cliffs, NJ: Prentice Hall, 1984): 901-908.

The Disaster Research Center (DRC) undertook a nationwide study of private citizens who organize themselves in groups to prepare for or to recover from disasters. Part of that research looked for citizen groups preparing for earthquakes. They found, relatively and absolutely, few earthquake preparedness citizen groups. To explain this finding, they detailed an explanatory model which specifies the conditions necessary for the general emergence of citizen groups, and apply it to the likelihood of earthquake preparedness groups. The implications for earthquake planning in general and some of the atypical characteristics, careers, and consequences of such groups are also noted.

Quarantelli, E. L. Planning for Transportation Accidents Involving Hazardous Materials. Journal of Hazardous Materials, 27 (1991): 49-60.

Disasters from mishaps and accidents in the transportation of hazardous materials, chemical, nuclear or biological-will become more numerous and worst in the future. We indicate some reasons for this probable trend. Problems in establishing and developing preparedness planning for such kinds of disastrous occasions are then discussed on the basis of findings and observations from social science research studies. In addition, we examine some of the difficulties that exist in mounting an emergency or first response to actual crisis occasions. Particularly looked at are some typical situational contingencies in hazardous material disasters.

Quarantelli, E. L. Community Crises: An Exploratory Comparison of the Characteristics and Consequences of Disasters and Riots. Journal of Contingencies and Crisis Management 1 (1993): 67-78.

Some social science literature conceptualizes disasters and riots together, treating the two phenomena as involving but one relatively homogeneous type of social crisis. This is only valid if the pre-trans and post-impact behaviors in such consensus and conflict occasions are roughly the same. This assumption is examined by comparing the similarities and differences between what occurs in community disasters and riots as these have been reported in empirical studies, looking at behaviors appearing at the individual, organizational and community levels. Significant differences have been found supporting the notion that consensus-type crises such as disasters ought to be conceptualized as a different social category than riots.

Quarantelli, E. L. Patterns of Sheltering and Housing in U.S. Disasters. Disaster Prevention and Management 4 (1995): 43-53.

This text points out that the terms 'sheltering' and 'housing' are used in a variety of unclear and inconsistent ways in the disaster literature, and proposes a differentiation among emergency sheltering, temporary sheltering, temporary housing and permanent housing. The author indicates how they are paid differential attention in American disaster planning and gives specific observations about the four patterns, noting especially how they differ from one another. He suggests there will be a future increase in problems in all the patterns, and that it is not yet fully established to what extent these patterns are applicable in all types of societies.

Quarantelli, E. L. Local Mass Media Operations in Disasters in the USA. Disaster Prevention and Management, 5 (1996): 5-10.

This text summarizes twelve (12) general propositions, the findings from a series of field studies by the Disaster Research Center, about the operations of the local mass media in disasters in the USA. The topics covered range from the disaster planning undertaken by mass media organizations, to the content of the news reported, and about differences among the electronic and print media involved, to the input of citizens into stories about disasters. Additionally, it raises questions about the extent to which the findings can be extrapolated to other than US societies.

Quarantelli, E. L. Ten Criteria for Evaluating the Management of Community Disasters. Disasters, 21 (1997): 39-56.

The discussion herein concerns important factors in the local management of disasters. We contrast this with the related but distinct process of disaster planning. Our assumption is that what is crucial is not management per se, but good management. Thus, to assess intelligently the management of community disasters requires an answer to the question: What is good management? The results of empirical research carried out by social scientists over the past 40 years are drawn upon in considering this question. The criteria identified entail: (1) correctly recognizing differences between response and agent-generated demands; (2) adequately carrying out generic functions; (3) effectively ' Y mobilizing personnel and resources; (4) generating an appropriate delegation of tasks and division of labor; (5) adequately processing information; (6) properly exercising decision-making; (7) developing overall coordination; (8) blending emergent' and established organizational behaviors; (9) providing appropriate reports for the news media: and (10) having a well-functioning emergency operations centre.

Quarantelli, E. L. How Individuals And Groups React During Disasters: Planning And Managing Implications for EMS delivery. Preliminary Paper # 138.

This is paper on catastrophic disasters and the problems communities are likely to face in evacuation and sheltering. He points out, for example, that survivors often evacuate and shelter with family and friends but in a catastrophic disaster family and friends may also be impacted so evacuation and sheltering are much more complicated.

Quarantelli, E.L. and Gray, Jane. "Resarch Finding on Community and Organizational Preparations for and Responses to Acute Chemical Emergencies." Journal of Hazardous Materials 4 (1981): 331-342.

An open system model is used to analyze field data from a study of organizational and community preparedness for acute chemical emergencies. In particular, findings are presented on perceptions of threat, social climate and social or inter-organizational linkages. It is shown that the awareness of a need for preparedness is not translated into preparedness activities and practices unless there are supportive social factors or conditions between disasters and their implications for planning. First, for planning purposes, are disasters best approached generically or in agent-specific terms? (The answer, based mostly on research, is that the generic approach is more valid. This does not mean there are no meaningful differences between disasters.) Second, along what lines might disasters be usefully differentiated? (Eight dimensions significant for emergency responses are discussed.) Third, what distinctions are made, and do they apply equally in all phases of the disaster planning cycle: mitigation or prevention, emergency preparedness, emergency response, and recovery? (It appears that the generic approach is most applicable in the emergency phases and somewhat less so in the mitigation phase. Recovery falls somewhere in between.) Answering these questions is a useful way to discuss the institutional and organizational behavior appropriate for disaster planning in different situations.

Rahman, Md Anisur (1993). People's Self-Development: Perspectives on Participatory Action Research. London; ZED Press.

Relph, Edward (1987). The Modern Urban Landscape. Baltimore; John Hopkins University Press.

Relph, Edward (1976). Place and Placelessness. London; Pion Limited.

Riad, Jasmin. Hurricane Threat and Evacuation Intentions: An Analysis of Risk Perception, Preparedness, Social Influences, and Resources. U of Del.

Richman, Jennifer and Forsyth, Marion (Eds.). (2004). Legal Perspectives on Cultural Resources. Walnut Creek; AltamMira Press.

Rihani, Samir. (2002). Complex Systems Theory and Development Practice: Understanding Non-linear Realities. London: Zed Books.

Rist, Gilbert. (2001). The History of Development: From Western Origins to Global Faith. London: Zed Books.

Robb, Caroline (1999, 2002). Can the Poor Influence Policy?; Participatory Poverty Assessments in the Developing World. Washington; World Bank.

Roberts, Patrick. 2006. "FEMA after Katrina", Policy Review 137 (June/July).

Rogers, E. (1983). Diffusion of Innovation. NY: Free Press. 1983.

Rogers' book contributes to our understanding of how, when, why people adopt new idea and change. Those interested in changing behavior around issues of disaster preparedness, disaster mitigation, and building sustainable resilient communities may find this useful. Rogers defines diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system. This book proposes four main elements that influence the spread of a new idea: the innovation, communication channels, time and a social system. Individuals progress through five stages: knowledge, persuasion, decision, implementation and confirmation.

Roseland, Mark (1998). Toward Sustainable Communities: Resources for Citizens and Their Governments. Gabriola Island B.C.: New Society Pub.

This book is a practical guide to building sustainable and resilient communities.

Ross, G. Alexander. The Emergence of Organization Sets in Three Ecumenical Disaster Recovery Organizations: An Empirical and Theoretical Exploration. Human Relations 33 (1980): 23-29.

The paper focuses on the emergence of the organization sets of three ecumenical disaster recovery organizations. After outlining a model of the emergence of organization sets, it is demonstrated that the three phases in the model, crystallization, recognition, and institutionalization, are associated with specific changes in the characteristics of all three organization sets studied. The changes exhibited concern the size of the organization set, the hierarchical level of boundary personnel, the standardization of inter-organizational contacts, and the specialization of boundary positions. The consistency of the model with the open systems perspective on organizations is discussed.

Russell, Diane and Harshbarger, Camilla (2003). Groundwork for Community-Based Conservation: Strategies for Social Research. Walnut Creek, CA; Altamira Press.

Schneider, R.O. (2002). Hazard mitigation and sustainable community development. Disaster Prevention and Management, 11(2): 141-147.

Emergency management has come to be regarded by many analysts as a critical part of the development of sustainable communities. The emergency management function has been linked to issues such as environmental stewardship and community planning. Especially important is the linkage between hazard mitigation efforts and community planning in the context of building sustainable communities. But this conceptual linkage has been difficult to implement in practice. The resolution of this difficulty and a clarification of the essential linkage of hazard mitigation to community planning will require a broader definition and a reformulation of the emergency management function. It will also require an assessment and the removal of impediments that currently stand in the way of the implementation of this linkage. Practical steps can be taken to begin this important chore.

Scott, James C. (1998). Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed. New Haven; Yale University Press.

Scott, James C. (1992). Domination and the arts of resistance. New Haven: Yale Press.

Scott's books are important for anyone who is working with racial, ethnic, and minority groups and local communities. Scott provides a detailed analysis of communication systems between different groups and classes. His insights could be found to be important for those who want to understand what is being said and what is not being said. He has important section on how people talk about and experience what is often call the inevitable. He also helps the readers understand the hidden communication of groups and how language reinforces oppression and domination.

Sea Grant Louisiana, (2005). Katrina & Rita. Lagniappe, 29(10), 1-6.

This article examines the effects on the fishing and seafood industries due to Hurricanes Katrina and Rita as two separate factors. Both hurricanes were devastating on the fishing economy. The affect was not only economic, but recreationally which affects communities even further. Hurricane Katrina resulted in tremendous land loss, more so than in the last forty-eight years combined. Loan distribution is examined and economic projection with past hurricane recovery as a basis for the model. Vehicle roundup is discussed as it assists those in need of reclaiming lost vessels essential for livelihood in the fishing industry. The Louisiana Department of Wildlife and Fisheries is also providing free copies of paperwork in an effort to jump start the fishing industries recovery. The seafood products from the affected areas are under question as to the legality of human consumption due to possible poisoning.

Seamon, David and Mugerauer, Robert (1989). Dwelling, Place, & Environment; Towards a Phenomenology of Person and World. NY; Columbia University Press.

Selznick, Philip (1992). The Moral Commonwealth: Social Theory and the Promise of Community. Berkeley: University of Cal. Press.

Sen Amartya (1987). On Economics and Ethics. Oxford; Blackwell.

Sen Amartya (1992). Inequity Reexamined. Cambridge; Harvard University Press.

Sen Amartya (1999). Development and Freedom. NY; Knopf.

Sevier, M.B. (1990). Land Uses of Terrebonne Parish: A Historical Geography. Unpublished master's thesis, University of Southwestern Louisiana.

This thesis discusses the major and secondary human made waterways of Terrebonne and the background information on canalization (i.e., *Rivers and Harbors Acts of 1926 and 1947* and the reversal of the *Homestead Act of 1866*). High water points, including the 1920 levee construction of the Atchafalaya, the 1950 Avoca Island levee construction which allows salt-water intrusion, the high water period in Houma of 1973 and jet stream caused flood in Houma in 1983 were also presented. Also examined are historic land uses in Terrebonne including the Houmas settling in Terrebonne in 1776; the settlement under the French, the introduction of sugar cane, the formation of Terrebonne Parish, Houma was incorporated and became the parish seat in 1834, the development of the oyster industry, the period of Land Reclamation, the introduction of the modern shrimping net by the U.S. Bureau of Fisheries, the establishment of the Sugar Cane Experimental Field Station and Laboratory following the growth of demand from WWI and oil coming to Houma. Modern land use was also examined in which the author finds 88% of the area as underdeveloped and residential development occurring mostly in the south. The waste disposal system and modern drainage in also studied.

Shiva, Vandana (1989). Staying Alive; Women, Ecology, and Development; London; Zed Books.

Shiva, Vandana (1994). Close to Home: Women, Reconnect Ecology, Health and Development. Philadelphia New Society Press.

Shiva, Vandana (1997). Biopiracy: The Plunder of Nature and Knowledge. New Delhi: Research Foundation for Science, Technology, and Ecology.

Shrader-Frechette, Kristin (2002). Environmental Justice: Creating Equality, Reclaiming Democracy. Oxford; Oxford University Press.

Sillitoe, Paul, Bicker, Alan and Pottier, Johan (2002) Participating in Development: Approaches to Indigenous Knowledge. London: Routledge.

Development has often failed. The policies imposed from above by agencies have frequently not met the needs and aspirations of local people. This work seeks to correct this failure. This volume focuses on two issues. One, how indigenous should be defined and who should define it? Second, once this is achieved what methodologies should be used? This book provides good theoretical bases and practical strategies for intervention.

Sillitoe, P., Bricker, A., & Pottien, J. (2002). Participating in development approaches to indigenous knowledge. 1st ed. Oxford, UK: Routledge.

As the title indicates, this is an extensive text on the values of indigenous knowledge (IK) both within the lives of the people and in considering development of the areas inhabited by these people. The IK can only be completely understood from an insider's perspective, and as such, outside developers who enter into an area should first engage the locals to find out from their IK what they perceive to be the best course of action. He denotes three models to explore the relationship between IK and science. The first model is a continuum. On one end is the poor farmer with no education and exposure to scientific knowledge, and on the other end is the Western scientist and a wide variety of people with different levels of education, exposure to other knowledge systems and identity occupying the space in between. The second model is a circle on which he plots different stakeholders. This becomes a two-way learning process with no scope for hierarchical positioning and in which no one has a privileged position. Yet Sillitoe is not satisfied with either of these models as some form of hierarchy inadvertently creeps in, especially if we admit that development must, in part, promote the use of scientifically informed technology to improve lives. His third solution is a three-dimensional curved space and sphere, in which the global plotting of different knowledge with scope for movement reflects the dynamism of knowledge. This global model would, he suggests, help in the comparison and co-relation of different knowledge central to IK research and endeavors. The global model conveys to the development community that local knowledge is not monolithic, but individually variable as is scientific knowledge.

Simpson, D. Building Neighborhood And Local Emergency Capacity: The Role of Community-Based Disaster Preparedness Programs. Hazard Reduction and Recovery Center.

Snow, David A and Robert D. Benford. 1988. "Ideology, Frame Resonance, and Participant Mobilization." International Social Movement Research 1: 197-217.

Stanton, M. E. (1971). The Indians in the Grand Calliou Dulac Community. Unpublished Master's thesis, Louisiana State University, Baton Rouge.

The author presents an account of the ethnicity present in this community with a focus on the Native American community. The structure of the community is examined in which it is found that political organization is lacking and most of the decisions are made by a select group of women. The economics of the community are also examined where it is found that the economy is dependent on the canning and boating industry, that women work in the canneries and there are conflicts over mineral rights in the area. Finally, the author studies the socio-historical development of the community including the isolation of the Houmas ending with the development of oil and gas and the urbanization and industrialization, the establishment of missions in the 1930s, the creation of a separated school system for Indians in 1944, the Houmas reliance upon subsistence until the 1950s which change to wage labor and commercial fishing, the debt to local merchants as a form of control, and their Culture resembling Cajun in ways such as language.

Stephen, R. & Rahn, J. (2003). Coastal hazards: Vulnerability of coastal population using GIS. The Geological Society of American 2003 Seattle Annual Meeting, November 2-5, 2003, Abstract with Programs, 35(6): 491.

The present study estimates the population along the coastal counties of Texas which are vulnerable to hurricane related coastal hazards. Understanding the distribution of population along the Texas coast is vital for damage control during coastal hazards. A regional coastal vulnerability for the coast has not been done at this stage or with the demographic data. There have been several attempts to calculate the vulnerability of the populations along coastal areas. Susan Cutter (1997) used vulnerability in her study that is the probability based on the incidences of natural hazards from historical records. Certain socio-economic factors, that make a population more vulnerable, were taken into consideration. The United States geological Survey (USGS) (2003) has also come up with a Coastal Vulnerability Index (CVI) calculated based on physical processes and geomorphic characteristics. Cutter's index does not take the physiography of the landscape into consideration while the USGS CVI does not incorporate the demographic factors of the area. The present study employs land elevation as the primary factor for assessing vulnerability to storm surge. The range of elevation is obtained from 24K dems. In a GIS the descriptive statistics of the elevation within each census tract in a county are calculated to estimate the number of people; density of the census tract is assumed to be uniform throughout. Similar socio-economic variables to those used by Cutter are considered to find the total vulnerability. A rough estimate is that approximately 8 per cent of the Texas coastal population is living below the threshold elevation. This type of an index, with physiographic and demographic components, helps to identify the most vulnerable population at a scale of census tracts, which is helpful for the local authorities for disaster preparedness and relief operation.

Stokes, G. A. (1985). Occupational Folklife in LA . In Louisiana Folklife: A Guide to the State. Baton Rouge: Moran Colorgraphic, Inc.

Streever, Bill. (2001). Saving Louisiana? The Battle for Coastal Wetlands. Jackson, MS: University Press of Mississippi.

This work provides an extensively detailed account of the Mississippi River's delta and its contamination to the detriment of wetlands throughout Louisiana. The results of the death of the marshland are also listed upon which global implications are expounded. This is a "problems-to-come" text and should be taken into consideration as an example of an area that will be susceptible to natural disasters of the slowly encroaching variety.

Taylor-Ide, Daniel (ed) (2002). Just and Lasting Change; When Communities Own Their Future. Baltimore Johns Hopkins Press.

Tierney, Kathleen J. Toward a Critical Sociology of Risk. Sociological Forum, 14 (1999): 215-242.

Sociologists are growing increasingly skeptical toward research on risk conducted in other fields, and new perspectives on risk are emerging. Topics that merit further exploration include the social construction of risk and risk objects, risk analysis as a type of scientific enterprise, the organizational and institutional forces that shape positions on risk, safety and risk as dynamic properties of social systems, and the social forces that create and allocate risk. In particular, sociologists need to place more emphasis on exploring the roles played by organizations and the state in hazard production and on formulating a political economy of risk. To a significantly greater degree than other disciplines concerned with risk, sociology emphasizes the contextual factors that structure vulnerability to hazards and the linkages that exist between vulnerability and social power.

Tierney, K. Disaster Preparedness and Response: Research Finding and Guidance from the Social Science Literature. University of Delaware.

Tierney, K. Research Overview: Emergency Response. U of Del.

Tierney, K. Sociology's Unique Contributions to the Study of Risk. U of Del.

Tule, Seth, Thomas Weber, Ingrid Shockley, and Paul C. Stern. 2002. "Factors Influencing the Participation of Local Governmental Officials in the National Estuary Program." Coastal Management 30: 101 – 120.

Turnhout, E., Van Brommel, S., and Aarts, N. How Participation Creates Citizens: Participatory Governance as Performative Practice.

Participation is a prominent feature of many decision-making and planning processes. Among its proclaimed benefits is its potential to strengthen public support and involvement. However, participation is also known for having unintended consequences which may lead to failures in meeting its objectives. This article takes a critical perspective on participation by discussing how participation may influence the ways in which citizens can become involved. Participation unavoidably involves (1) restrictions about who should be involved and about the space for negotiation, (2) assumptions about what the issue at stake is, and (3) expectations about what the outcome of participation should be and how the participants are expected to behave. This is illustrated by a case study about the Dutch nature area, the Drentsche Aa. The case study demonstrates how the participatory process that took place and the restrictions, assumptions, and expectations that were involved resulted in six forms of citizen involvement, both intended and unintended, which ranged between creativity, passivity, and entrenchment. Based on these findings, the article argues that participation does not merely serve as a neutral place in which citizens are represented, but instead creates different categories of citizens. Recognizing this means reconceiving participation as performative practice. Such a perspective goes beyond overly optimistic views of participation as a technique whose application can be perfected, as well as pessimistic views of participation as repression or domination. Instead, it appreciates both intended and unintended forms of citizen involvement as meaningful and legitimate, and recognizes citizenship as being constituted in interaction in the context of participation.

United States Congress, Senate. 2002. The Coastal Zone Management Act: hearing before the Subcommittee on Oceans and Fisheries of the Committee on Commerce, Science, and Transportation, United States Senate, One Hundred Sixth Congress, first session, May 6, 1999. Washington, DC: U.S. Government Printing Office.

United States Congress, Senate, Committee on Commerce, Science, and Transportation. 2000. Coastal Zone Management Act of 2000 : report of the Committee on Commerce, Science, and Transportation on S.1534. Washington, DC: U.S. GPO.

U.S. Commission on Ocean Policy. 2004. "An Ocean Blueprint for the 21st Century", final report by the U.S. Commission on Ocean Policy.

Vale, Lawrence J. and Campanella, Thomas J. (2005). The Resilient City: How Modern Cities Recover from Disaster. Oxford; Oxford University Press.

Verhelst, Thierry (1987). No Life without Roots: Culture and Development. London: Zed Books.

Viosca, Jr., P. (1928). Louisiana wet lands and the value of their wild life fishery Resources. Ecology, 9(2), 216-229.

This article discusses the vanishing species from the Louisiana wetlands. The basic premise is that loss of land facilitates loss of species. The author finds a breakdown of the physical elements of Louisiana's wetlands. Also noted is a tie into the economic and commercial decline as a result of these environmental declines brought about by man. The article sites an array of failing, man-made devices for nature control, that contribute to the decline in life within wet areas. Of special note is that this article was published in 1928 and that these events still occur today, increases the validity of this research.

Walker, Brian and Salt, David (2006). Resilience Thinking: Sustaining Ecosystems and People in a Changing World. Washington; Island Press.

Webb, R. G., Tinerney, J. K., Dahlhamer, & James, M. (2000). Business and disasters: empirical patterns and unanswered questions. Natural Hazard Review, 1(2):83-90.

Through five systematic, large-scale mail surveys conducted since 1993, the Disaster Research Center has obtained data on hazard awareness, disaster impacts, and short and long-term recovery among 5,000 private-sector firms in communities across the United States (Memphis /Shelby County, Tennessee; Des Moines, Iowa; Los Angeles, California; Santa Cruz County, California; and South Dade County, Florida). This paper summarizes findings from those studies in three major areas: (1) Factors influencing business disaster preparedness; (2) Disaster-related sources of business disruption and financial loss; and (3) Factors that affect the ability of business to recovery following major disaster events. Implications of the research for business contingency planning and business disaster management are discussed.

Wilkins, James G. and Rodney E. Emmer. 2008. "Review of Land Use Planning in Coastal Louisiana: Recommendations for Protection from Natural Hazards." Sea Grant publication LSU-R-08-013.

Natural Hazards Center Publications: Quick Response Reports
http://www.colorado.edu/hazards/research/qr/

QR89 - Community Disaster Recovery: It Is Not Getting Easier. Claire B. Rubin. 1996.
QR101 – Hurricane Threat and Evacuation Intentions: An Analysis of Risk Perception, Preparedness, Social Influence, and Resources, Jasmin K. Riad and Fran H. Norris
QR113 - The Mass Media, Political Fragmentation, and Environmental Injustice in Puerto Rico: A Case Study of the Floods in Barrio Tortugo. Marla Perez-Lugo. 1999.
QR114 - Effectiveness Of Geographic Information Systems (GIS) Applications In Flood Management During And After Hurricane Fran. Ute J. Dymon. 1999.
QR115 - A Review of Relief: An Examination of the Response to Hurricane Georges in the Dominican Republic. David A. McEntire. 1999.
QR117 - Hurricane Georges: The Experience of the Media and Emergency Management on the Mississippi Gulf Coast. Henry W. Fischer III. 1999.
QR120 - Assessing "Practical Knowledge" of FEMA's Responsiveness and Effectiveness in the Aftermath of Hurricane Bonnie, in Wrightsville Beach and Topsail Island, North Carolina. Melissa L. Tollinger and Deborah Dixon. 1999.
QR122 - Natural Disaster Episode: Impacts, Emergency Response, and Health Effects of Hurricane Georges in the Gulf Coast. Francis O. Adeola. 2000.
QR128 - South Carolina's Response to Hurricane Floyd. Kirstin Dow and Susan L. Cutter. 2000.
QR129 - An Analysis of the Socioeconomic Impact of Hurricane Floyd and Related Flooding on Students at East Carolina University. Bob Edwards, Marieke Van Willigen, Stephanie Lormand, Jayme Currie, et al. 2000.
QR133 - An Evaluation of How ECU Staff Persons Coped With Hurricane Floyd. Holly M. Hapke, Ronald Michelson. 2000.
QR142 - Disaster and Development: El Salvador 2001. Ben Wisner. 2001.
QR155 - Public/Private Collaboration in Disaster: Implications from the World Trade Center Terrorist Attacks. Richard T. Weber, David A. McEntire, Robie J. Robinson. 2002.

QR167 – Colorado Wildfires 2002. Charles Benight, Eve Gruntfest, Kelly Sparks. 2004.

Natural Hazards Center: Information About Public Hazards Communication

Anderson, Jon W. 1968. "Cultural Adaptation to Threatened Disasters." Human Organization 27:298-307.

Anderson, William A. 1969. "Disaster Warning and Communication Processes in Two Communities." Journal of Communication 19 (2):92-104.

Aguirre, B. 1991. "Evacuation in Cancun During Hurricane Gilbert." International Journal of Mass Emergencies and Disasters 9 (1):31-45.

Aguirre, B. E., Dennis Wenger, and Gabriela Vigo. 1998. "A Test of the Emergent Norm Theory of Collective Behavior." Sociological Forum 13 (2): 301-320.

Atwood, L. Erwin and Ann Marie Major. 1998. "Exploring the "Cry Wolf" Hypothesis." International Journal of Mass Emergencies and Disasters 16:279-302.

Baker, E.J. 1979. "Predicting Response to Hurricane Warnings: A Reanalysis of Data from Four Studies." Mass Emergencies 4 (1):9-24.

Baker, Earl J. 1995. "Public Response to Hurricane Probability Forecasts." Professional Geographer 47 (2):137-147.

- Found that evacuation notices from local officials were more important than other threat concerns and that hurricane probabilities did little to moderate the effect.
- Variables utilized to create 16 hypothetical scenarios included:
  - Severity of storm
  - Tract and position
  - National Hurricane Center Alerts
  - Officials' Evacuation Notices
  - Probabilities
- Results indicate that individuals are capable of comprehending probabilities more than indicated in the literature.
- Important is the fact that citizens still take heed to advice offered from public officials.

Baker, J. 1984. "Public Response to Hurricane Probability Forecasts." National Weather Service, Washington DC.

Baker, Jay. 1987. "Warning and Evacuation in Hurricanes Elena and Kate." Department of Geography, Florida State University, Tallahassee, FL.

Bateman, Julie M. And Bob Edwards. 2002. "Gender and Evacuation: A Closer Look at Why Women are More Likely to Evacuate for Hurricanes." Natural Hazards Review 3:107-117.

Blanchard-Boehm, R. Denise. 1998. "Understanding Public Response to Increased Risk from Natural Hazards: Application of the Hazards Risk Communication Framework." International Journal of Mass Emergencies and Disasters 16 (3):247-278.

Blaylock, Bruce K. 1981. "Method For Studying the Perception of Risk." *Psychological Reports* Volume 49 (1981): 899-902.

- The results of the Analysis of Variance indicated that there was indeed an interaction of traditional risk measures, the environment, and the individual's information-processing preferences.
- This study indicated the importance of having both situational and individual components (information processing preferences) to any attempt at gauging what matters in risk perception.

Burby, R.J. and F. Wagner. 1996. "Protecting Tourists from Death and Injury in Coastal Storms." Disasters 20 (1):49-60.

Of particular concern was the lack of preparedness regarding evacuation of guests by most hotels.

- Linked to this in New Orleans is the concern over the fight for public transportation especially factoring in the large percentage of New Orleans residents who will have to upon it.
- The authors offer two ways to reduce vulnerability:
  - Evacuation plans and awareness.
  - Advances in strengthening structures.

Carter, Michael T. 1980. "Community Warning Systems: The Interface Between the Broadcast Media, Emergency Service Agencies and the National Weather Service." Pp. 214-228 in Disasters and the Mass Media. Washington, D.C.: Committee on Disasters and Mass Media, National Academy of Sciences.

Carter, Michael T., Stephanie Kendall, and John P. Clark. 1983. "Household Response to Warnings." International Journal of Mass Emergencies and Disasters 9 (1):94-104.

Chiu, A. And et.al. 1983. "Hurricane Iwa, Hawaii, November 23, 1982." Washington, D.C.: National Academy of Sciences.

Christensen, Larry and Carlton E. Ruch. 1980. "The Effect of Social Influence on Response to Hurricane Warnings." Disasters 4 (2):205-210.

Danielson, Jeris A. 2000. "Investigation into Major Evacuations." Lakewood, CO: Danielson and Associates, Inc.

Dow, Kirstin and Susan L. Cutter. 1998. "Crying Wolf: Repeat Responses to Hurricane Evacuation Orders." Coastal Management 26 (4):237-252.

- Studies of perceptions of hurricane risk have examined the influential factors such as: prior experience of hurricanes; residence in flood prone areas, interpretation of hurricane probability data.
- Factors such as age, gender, past experience are poor predictors of response to threat.
- Evacuation for hurricanes varies from 25% - 95%.
- Baker's (1991) generalizations about responses to threats
  - Most important in affecting public response are the definition of the risk area and actions of public officials.
  - More than 90% of residents in high-risk barrier islands and open coast will evacuate in response to strong, clear warning from officials.
  - General knowledge of hurricane evacuation is largely accounted for by the hazardousness of the area, action of authorities, type of housing, prior perception of personal risk, and storm specific threat factors.
- In conclusion, the experience of false alarms does not really sway the perception of risk.

Drabek, Thomas E. 1969. "Social Processes in Disaster: Family Evacuation." Social Problems 16:336-349.

Drabek Thomas E. 1994a. "Disaster Evacuation and the Tourist Industry." Boulder, CO: Natural Hazards Research and Applications Information Center, Institute of Behavioral Science, University of Colorado.

Drabek, Thomas E. 1994b. "Risk Perceptions of Tourist Business Managers." Environmental Professional 16:327-341.

Drabek, Thomas E. 1995. "Disaster Responses Within the Tourist Industry." International Journal of Mass Emergencies and Disasters 13:7-23.

Drabek, Thomas E. 1996. Disaster Evacuation Behavior: Tourists and Other Transients. Boulder, CO: Natural Hazards Research and Applications Information Center, Institute of Behavioral Science, University of Colorado.

Drabek, Thomas E. 1999. “Chapter 4- Evacuation Behavior” in Disaster-Induced Employee Evacuation. Boulder: University of Colorado.

Drabek, Thomas E. 1999a. "Disaster-Induced Employee Evacuation." Boulder, CO: Natural Hazards Research and Applications Information Center, Institute of Behavioral Science, University of Colorado.

Drabek, Thomas E. 1999b. "Understanding Disaster Warning Responses." The Social Science Journal 36(3):515-523.

Drabek Thomas E. 2000. "Pattern Differences in Disaster-Induced Employee Evacuations." International Journal of Mass Emergencies and Disasters 18:289-315.

Drabek, Thomas E. 2001. "Disaster Warning and Evacuation Responses by Private Business Employees." Disasters 25 (1):76-94.

- Three different theoretical approaches to evacuation: bounded rationality, emergent norm perspective, stress-strain perspective.
- Drabek runs hierarchical analysis with seventy-one (71) variables but model never explains more than 2% of the variance.

Drabek, Thomas E. And Keith Boggs. 1968. "Families in Disaster: Reactions and Relatives." Journal of Marriage and the Family 30:443-451.

Drabek, Thomas and John S. Stephenson III. 1971. "When Disaster Strikes." Journal of Applied Social Psychology 1 (2):187-203.

Dynes, Russell R. And E.L. Quarantelli. 1976. "The Family and Community Context of Individual Reactions to Disaster." Pp. 231-245 in Emergency and Disaster Management: A Mental Health Sourcebook, edited by H. Parad, H. L. Resnik, and L. Parad. Bowie, MD: Charles Press.

Fitzpatrick, Colleen, and Dennis S. Mileti. 1991. "Motivating Public Evacuation." International Journal of Mass Emergencies and Disasters 9(2):137-152.

Foster, Harold D. 1980. Disaster Planning: The Preservation of Life and Property. New York, NY: Springer-Verlag.

Fothergill, Alice , Enrique G.M. Maestas, and joanne derouen Darlington. 1999. "Race, Ethnicity and Disasters in the United States: A Review of the Literature." Disasters 23 (2):156-173.

Friedsam, H. J. 1961. "Reactions of Older Persons to Disaster-Caused Losses: A Hypothesis of Relative Deprivation." Gerontologist 1:34-37.

Friedsam, H. J. 1962. "Older Persons in Disaster." Pp. 151-184 in Man and Society in Disaster, edited by G. W. Baker and D. W. Chapman. New York, NY: Basis Books.

Fritz, Charles E. 1957. "Disasters Compared in Six American Communities." Human Organization 16:6-9.

Fritz, Charles E. 1961. "Disasters." Pp. 651-694 in Contemporary Social Problems, edited by R.K. Merton and R. A. Nisbet. New York, NY: Harcourt.

Fritz, Charles E. And Eli Marks. 1954. "The NORC Studies of Human Behavior in Disaster." Journal of Social Issues 10 (3):26-41.

Fritz, Charles E. And J.H. Mathewson. 1957. "Convergence Behavior in Disasters." Washington, D.C.: National Research Council, National Academy of Sciences.

Gladwin, Hugh and Walter Gillis Peacock. 1997. "Warning and Evacuation: A Night for Hard Houses." Pp. 52-74 in Hurricane Andrew: Ethnicity, Gender and the Sociology of Disasters, edited by W. G. Peacock, B. H. Morrow, and H. Gladwin. New York, NY: Routledge.

Glass, Albert J. 1970. "The Psychological Aspects of Emergency Situations." Pp. 62-69 in Psychological Aspects of Stress, edited by H. S. Abram. Springfield, IL: Charles C. Thomas.

Goldstein, Arnold P. 1960. "Reactions to Disaster." Psychiatric Communications 3(2).

Gruntfest, E. And M. Weber. 1998. "Internet and Emergency Management: Prospects for the Future." International Journal of Mass Emergencies and Disasters 16 (1):55-72.

The analysis has six components:

1) a brief history of the field prior to the introduction of the internet;
2) an overview of the changes in emergency management since the introduction of the Internet and a summary of the characteristics of Internet communications;
3) some descriptions of how the Internet is currently used in flood, earthquake, and volcano research;
4) examples of Internet use as a tool for education;
5) federal and state employment of the Internet in emergency management during disasters and for public education and awareness between disasters, and
6) conclusions and suggestions for further research.

Heimer, Carol A. 1988. “Social Structure, Psychology, and the Estimation of Risk.” Annual Review of Sociology 14: 491-519.

The author provides a survey of the psychology literature of estimation of risk, and places specific focus on how this literature can be linked to work of sociologists. Perception of risk from a psychologist’s standpoint deals with the unknown. A risky decision is one in which an individual chooses between two gambles. Two important questions emerge for psychologists. First, they ask how people perceive risk (judgment). Secondly, they examine how people make choices when there is uncertainty about outcomes. Both questions are important because the first dealing with judgment directly affects the second one on choice. People use heuristics in both judging and choosing.

- The main heuristics are: availability (of information), representativeness (perception versus reality), and mirage (perceive many choice, but actually only one option).
- Representativeness links a person’s prior perception to the present scenario.
- Mirage involves that mis-estimation of risks associated with an option.
- These heuristics cause an individual to misjudge or estimate the “riskiness” of a situation wrong.
- Heuristics in turn impacts the choice that is made by an individual. This could especially be the case in evacuation behavior.

Lindell, Michael K., Ronald W. Perry, and Marjorie R. Greene. 1980. "Race and Disaster Warning Response." Seattle, WA: Battelle Human Affairs Research Centers.

The four hypothesis tested included:

1) The more specific the warning message, the higher the warning belief;
2) The more specific the message, the greater the perceived personal risk;
3) The higher the level of warning belief, the greater the probability that the warning recipient will engage in the suggested adaptive response; and
4) The greater the perceived personal risk, the more likely it is that the individual will undertake the suggested adaptive response.

The data collected supported all four hypotheses regarding the interrelationships among the warning system variables. Furthermore, three primary race differentials were discovered: 1) Mexican-Americans were more skeptical than whites about believing warning messages, 2) Mexican-Americans interpreted the same messages as indicating lower levels of personal danger, and 3) Mexican-Americans were less likely to evacuate than whites.

McDavid, J. And M. Marai. 1968. Social Psychology. New York, NY: Harper and Row.

While using a primarily psychological point of view, this introduction to the inherently interdisciplinary field of social psychology seeks to weld parts of all of the social sciences: anthropology, economics, political science, psychology and sociology into one amalgamation. The more consistency with which a warning message is delivered, the more likely the receiver is to personalize the warning.

Mileti, Dennis S. 1974. A Normal Causal Model Analysis of Disaster Warning Response. Boulder, CO: University of Colorado.

Found that there is no relationship between family unity and that family’s likelihood for responding to a warning message.

Mileti, Dennis S. And E. M. Beck. 1975. "Communication in Crisis: Explaining Evacuation Symbolically." Communication Research 2(1):24-49.

- The more certainty with which a warning message is delivered, the more likely the receiver is to believe it.

- The more frequently a warning message is delivered, the more likely the public is to believe it.
- If confirmation of the disaster/hazard happens, people are more likely to believe a warning message.
- A person is more likely to personalize a message if it is delivered frequently.
- The more frequently a warning message is delivered, the more likely the public is to respond to it.
- The public is more likely to respond to a warning message if it receives that message from the mass media.
- The more specific a warning message is, the more likely the public is to respond to it.
- Believing a warning message increases the likelihood of responding to it.
- The more a person personalizes a warning message, the more likely they are to respond to it.
- The older a person is, the less likely they are to respond to a warning message.
- The more cues a person receives, the more likely they are to believe a warning message.

Mileti, Dennis S. And Colleen Fitzpatrick. 1991. .Communication of Public Risk: Its Theory and its Application. Sociological Practice Review 2 (1): 20-28.

- Central to the outcome of risk communication and education efforts are the perceptions that the public holds about the risk.
- Communications of risk influences these perceptions and behavior.
- Risk communication is not a simple act of stimulus-response; rather, it is a process.
- This paper details the process of risk communication that involves characteristics of the message itself and personal characteristics of those receiving the message.
- A general model representing the interrelationship of these various factors that serve to influence risk perception behavior is presented.
- This model has been put into practice by those responsible for communicating risk to endangered publics.
- Example applications are also presented.

Mileti, Dennis S. And Paul W. O'Brien. 1992. .Warnings During Disaster: Normalizing Communicated Risk. Social Problems 39:40-57.

- The more certainty with which a warning message is sent, the more likely the public is to respond to the warning.
- The more consist a warning message is, the more likely the public is to respond to it.
- The more frequently a warning message is delivered, the more likely the public is to respond to it.
- The more specific a warning message is, the more likely the public is to respond to it.
- Men are less likely to respond to a warning message than are women.
- Being older in age makes a person less likely to respond to a warning message.

- The more environmental cues the public receives, the more likely they are to respond to a warning message.
- A person is more likely to respond to a warning message if they are experiencing damage during the disaster/hazard.
- A person is more likely to respond to a warning message if they have had prior hazards experience.
- If a person perceives an increased risk or loss, they are more likely to respond to a warning message.
- If a person is involved with a community response to a hazard/disaster, they are more likely to respond to a warning message.

Moore, Harry E., Frederick L. Bates, Marvin V. Layman, and Vernon J. Parent on. 1963. "Before the Wind: A Study of Response to Hurricane Carla." Washington, D.C.: National Research Council, National Academy of Sciences.

- A member of a minority group is less likely to believe a warning message.
- The older a person is, the less likely they are to respond to a warning message.
- If a person has had a recent experience with a hazard/disaster, they are more likely to respond to a warning message.
- Receiving a warning message through a personal channel, increases the likelihood of a person believing the message.
- Working in a large organization decreases the likelihood of a person believing a warning message.

Nelson, Carnot E. et.al. 1988. Post-Hurricane Survey of Evacuees Sheltered in the Tampa Bay Region During Hurricane Elena in 1985.. Tampa, FL: Department of Community Affairs, Division of Emergency Management, with support of the Tampa Bay Regional Planning Council, University of South Florida.

The response to hurricanes requires the evacuation of large numbers of people form broad geographical regions in at relatively short period of time, a situation not encountered in other types of disasters, and one that presents problems unique to hurricane evacuation. Presently, most evacuation plans are based upon behavioral and psychological findings that reflect what people say they would do, rather than what they actually do. Following Hurricane Elena in 1985, the authors of this article sought to answer the following questions:

1) Who evacuated, and did they do so voluntarily and/or unnecessarily?
2) Where did people go, and if to public shelters, did they go to their assigned shelter?
3) What were the ages and special needs of the evacuees? and
4) How did actual behavior compare with predictions of the behavioral studies?

In order to address the questions, five studies were conducted, all of which involved respondents from the Tampa Bay area of west-central Florida. Data for two studies involving public shelters was collected from American Red Cross shelter registration materials, while the data on the general public's response behavior was collect in a follow-up survey of respondents having been previously questioned as to their intended hurricane evacuation behavior. Findings include discussions on the importance of defining and communicating risk-zones to the public; the special needs of mobile home residents and the elderly and difficulties in designating public shelters by zone. Findings on the accuracy of previous behavioral and psychological based surveys were mixed, but overall suggest that behavioral intentions are useful in predicting actual behavior.

Neuwirth, Kurt, Sharon Dunwoody and Robert J. Griffin. 2000. "Protection Motivation and Risk Communication." Risk Analysis 20:721-734.

The public is more likely to respond to a warning message if that message contains risk information and/or information about the severity of the threat. If a person feels some personal efficacy, they are more likely to respond to a warning message.

Nigg, Joanne M. 1987. "Communication and Behavior: Organizational and Individual Response to Warnings." Pp. 103-117 in Sociology of Disasters, edited by R. R. Dynes, B. Demarchi, and C. Pelanda. Milan, Italy: Franco Angeli Libri.

- The more certainty with which a warning message is delivered, the more likely the receiver is to believe the message.
- If a sender uses electronic media to relay a warning message, the receiver is more likely to believe it.
- If a warning message comes from an official source, the receiver is more likely to believe it.
- If a person has had prior hazards experience, they are less likely to believe a warning message, but more likely to personalize it.
- If a person has membership in a minority group, they are less likely to believe a warning message.
- The less certain a sender is about a warming message, the less likely the receiver is to confirm that message.
- The more clarity with which a warning message is sent, the more likely the receiver is to personalize it.
- The more consistency with which a warning message is sent, the more likely the receiver is to personalize it.
- The more specific a warning message is, the more likely the receiver is to personalize it.
- If a person receives confirmation of a warning message, they are more likely to personalize it.
- The more clarity with which a warning message is sent, the more likely the receiver is to respond to it.
- The more consistency with which a warning message is sent, the more likely the receiver is to respond to it.
- A person is more likely to believe a warning message if that message is received through a personal channel.

Parr, Arnold R. 1998 .Disasters and Human Rights of Persons with Disabilities: A Case for an Ethical Disaster Mitigation Policy... Australian Journal of Emergency Management 12(4): 2-4.

This article states that disaster management for disabled persons is a neglected topic that requires urgent attention, and argues that disaster mitigation policy needs to take into account a “bill of rights” for persons with disabilities. More so, it is asserted that the continued neglect of disabled persons during mitigation policies and of them in mitigation research constitutes a serious violation of disabled person’s human rights and fundamental freedoms. The author states that this neglect would be best accomplished through an intensive public education campaign.

Perry, Ronald W. 1979. Evacuation Decision-Making in Natural Disasters... Mass Emergencies 4:25-38.

- The older a person is, the less likely they are to hear a warning message.
- The more credibility the sender of a warning message has, the more likely the receiver is to believe it.
- The more frequently a warning message is delivered, the more likely the public is to believe it.
- The more specific the warning message is, the more likely the receiver is to believe it and personalize it.
- If a person has had previous hazards experience, they are more likely to believe a warning message.
- A person is more likely to personalize a message if it comes from a credible source.
- A person is more likely to personalize a message if it is delivered frequently.
- The more hazards experience a person has had, the more likely they are to personalize a warning message.
- The more specific a warning message is, the more likely the public is to respond to it.
- The older a person is, the less likely they are to respond to a warning message.
- A person is more likely to respond to a warning message if they have had prior hazards experience.
- If a person has knowledge about a protective response, they are more likely to respond to a warning message.
- A person with membership in social networks is more likely to respond to a warning message.
- Believing a warning message increases the likelihood of responding to it.
- The more a person personalizes a warning message, the more likely they are to respond to it.
- If a family experiences frequent kinship interaction, they are more likely to hear a warning message.

Perry, Ronald W. 1987. .Disaster Preparedness and Response among Minority Citizens... Pp. 135-151 in Sociology of Disasters edited by R. R. Dynes, B., Demarchi and C. Pelanda. Milan, Italy: Franco Angeli Libri.

- A person is more likely to hear a warning message if it is delivered in the language in which they speak.
- A person with majority group membership is less likely to understand a warning message.
- The public is more likely to respond to a warning message if the message comes from a credible source.
- A person with membership in a minority group is less likely to respond to a warning message.
- If a person feels some personal efficacy, they are more likely to respond to a warning message.
- If a family is together in the same place at the same time, they are more likely to respond to a warning message.
- Believing a warning message increases the likelihood of responding to it.
- The more a person personalizes a warning message, the more likely they are to respond to it.
- A person with a high socio-economic status is more likely to believe a warning message.

Perry, Ronald W. 1990. "Evacuation Warning Compliance Among Elderly Citizens." Disaster Management 3:94-96.

A person who is older in age is more likely to respond to a warning message.

Perry, Ronald W., Marjorie R. Greene, and Michael K. Lindell. 1980. .Enhancing Evacuation Warning Compliance: Suggestions for Emergency planning... Disasters 4 (4):433-449.

- The more experience a person has with disasters/hazards, the more likely they are to respond to a warning message.
- The better a person is able to perceive their time away from home, the more likely they are to respond to a warning message.
- If a person has had a recent experience with a hazard/disaster, they are more likely to respond to a warning message.
- The more time there is to impact of a disaster, the less likely a person is to respond.

Perry, Ronald W., Marjorie R. Greene, and Alvin Mushkatel. 1983. American Minority Citizens in Disaster. Seattle, WA: Battelle Human Affairs Research Center.

- Study findings support the hypotheses that as levels of perceived personal risk and warning belief increase, citizens are more likely to comply with evacuation warnings.
- Blacks who perceive risk to be low are more likely to undertake some protective action as warning belief increases, but the majority still do not evacuate.
- Whites and Mexican Americans tend to continue their normal routine when they believe their risk is low, even if risk warnings increase.
- People are more likely to believe a warning message if it is delivered via electronic media.
- The public is more likely to believe a warning from an official source.
- The greater a persons perceived risk, the more likely they are to believe a warning message.
- If confirmation of the disaster/hazard happens, people are more likely to believe a warning message.
- A person is more likely to personalize a message if it comes from a credible source.
- The more specific a warning message is, the more likely a person is to personalize it.
- A person is more likely to confirm a warning message if they have heard it.
- Black people are more likely to respond to a warning message than are non-blacks.
- If a person has knowledge about a protective response, they are more likely to respond to a warning message.
- Believing a warning message increases the likelihood of responding to it.
- The more a person personalizes a warning message, the more likely they are to respond to it.
- Having confirmation of the disaster/hazard increases the likelihood of a person responding to it.
- Receiving a warning message through a personal channel, increases the likelihood of a person believing the message.

Perry, Ronald W. And Michael K. Lindell. 1991. .The Effects of Ethnicity on Evacuation Decision Making... International Journal of Mass Emergencies and Disasters 9(1):47-68.

Many gaps still remain in the empirical record of behavioral response to evacuation warnings, particularly in the area of warning compliance among ethnic groups. This study employs a single stage theoretical model to examine how three ethnic groups, blacks, whites, and Mexican-Americans, respond to warnings, perceive risk, and view the credibility of warning sources. Other independent variables evaluated in the model include warning content, warning confirmation, income level, and whether the groups possess an adaptive plan for evacuating a threatened area. While it is possible to conclude that ethnic variations do exist on variables related to evacuation compliance, the model basically found that ethnicity and income had statistically no significant effects upon warning compliance. The study also indicated that the best predictor of compliance in each of the data sets was the level of perceived risk. The model was tested using data gathered from a flood in Abilene, Texas and a hazardous substance spill in Mt. Vernon, Washington.

Perry, Ronald W. And Michael K. Lindell. 1997. .Aged Citizens in the Warning Phase of Disasters: Re-Examining the Evidence. International Journal of Aging and Human Development 44 (4):257-267.

While there is a strong consistent empirical literature on older citizens in the recovery period of disasters, there is much less research on how the elderly respond to disaster warnings. Furthermore, there are conflicting findings among these studies, some characterizing the elderly as noncompliant and less likely to cooperate with authorities, while others find the elderly no less responsive than other age groups. The current article reviews the literature in this area and tries to sort out conflicting findings in terms of the timing of the research and methodological considerations. Data is analyzed from nine (9) disasters, which represent flood events, volcanic eruptions, and hazardous materials emergencies, which show citizens over sixty-five years of age no less likely to comply with disaster warnings than other persons.

Perry, Ronald W., Michael K. Lindell, and Marjorie R. Greene. 1981. Evacuation Planning in Emergency Management. Lexington, MA: Lexington Books.

- People with membership in a subculture and/or a voluntary association are more likely to hear a warning message.
- The older a person is, the less likely they are to hear a warning message.
- The more certainty with which a warning message is delivered, the more likely the receiver is to believe it.
- The more frequently a warning message is delivered, the more likely the public is to believe it.
- The more specific the warning message is, the more likely the receiver is to believe, understand, and/or personalize it.
- If confirmation of the disaster/hazard happens, people are more likely to believe and/or personalize a warning message.
- If a person has had hazard experience in the past, they are more likely to understand a warning message.
- A person is more likely to personalize a message if it comes from an official source and/or they are familiar with the source.
- The more hazards experience a person has had, the more likely they are to personalize a warning message.
- The more time until a disasters' impact, the more likely a person is to confirm that message.
- A person is more likely to respond to a warning message if they receive that message from a face-to-face channel.
- The more frequently a warning message is delivered, the more likely the public is to respond to it.
- The public is more likely to respond to a warning message if it comes from an official source.
- The public is more likely to respond to a warning message if the message comes from a credible source.
- People are more likely to respond to a warning message when that message comes from a familiar source.
- The more specific a warning message is, the more likely the public is to respond to it.
- The older a person is, the less likely they are to respond to a warning message.
- The older a person is, the more likely they are to respond to a warning message.
- The more environmental cues the public receives, the more likely they are to respond to a warning message.
- A person is more likely to respond to a warning message if they have had prior hazards experience.
- If a person has knowledge about a protective response, they are more likely to respond to a warning message.

- A person is more likely to respond to a warning message if they have had prior hazards experience.
- If a person has knowledge about a protective response, they are more likely to respond to a warning message.
- A person with membership in social networks is more likely to respond to a warning message.
- A person with membership in a minority group is less likely to respond to a warning message.
- If a person has had a recent experience with a hazard/disaster, they are more likely to respond to a warning message.
- If a family is together in the same place at the same time, they are more likely to respond to a warning message.
- Believing a warning message increases the likelihood of responding to it.
- The more a person personalizes a warning message, the more likely they are to respond to it.
- If a family experiences frequent kinship interaction, they are more likely to hear a warning message.

Perry, Ronald W., Michael K. Lindell, and Marjorie R. Greene. 1982a. .Crisis Communications: Ethnic Differentials in Interpreting and Acting on Disaster Warnings... Social Behavior and Personality 10 (1):97-104.

- Mexican-Americans were more skeptical than whites about believing warning messages, no matter how specific the message.
- Mexican-Americans interpreted the same warning messages as indicating lower levels of personal danger.
- Mexican-Americans were less likely to undertake a protective action (that is, evacuate) than whites.
- The more specific the warning message is, the more likely the receiver is to believe it and/or personalize it.
- Members of minority groups are less likely to believe a warning message.
- Members of disenfranchised ethnic groups are less likely to personalize warning messages.
- A person with membership in a minority group is less likely to respond to a warning message.
- Believing a warning message increases the likelihood of responding to it.
- The more a person personalizes a warning message, the more likely they are to respond to it.

Planning for the Evacuation of New Orleans" 2002. Institute of Transportation Engineers. ITE Journal. 72 (February).

- "…The relative safety that the levees provide and the low level of major hurricane activity in southeastern LA over the past 35 years have combined to foster attitudes of complacency to the significant threat that exists from tropical storm flooding in this region. Recently, however, the complacent attitudes of prior decades have begun to change."
- Major evacuation for Georges did not occur until the storm was tracking toward the center of New Orleans.
- Had Georges maintained the strength and track forecast, casualties could have exceeded 50,000.
- The article argues that one way to deal with this problem is to issue mandatory evacuation orders as early as possible, which could lead to many problems, such as wasted money for evacuations and the "Cry Wolf" scenario.

Prater, Carla, Dennis Wenger, and Kevin Grady. "Chapter 5- Evacuation Behavior" in Hurricane Bret Post Storm Assessment: A Review of the Utilization of Hurricane Evacuation Studies and Information Dissemination.

Quarantelli, E. L.1980. .Evacuation Behavior and Problems: Findings and Implications from the Research Literature... Columbus, OH: Disaster Research Center, Ohio State University.

- The public is more likely to hear a warning message that is delivered via the mass media.
- The public is more likely to believe a warning from an official source.
- A person is more likely to believe a warning message if they observe cues that support the message.
- If a person has had previous hazards experience, they are more likely to believe a warning message.
- The more stress a person feels, the less likely they are to believe a warning message.
- A person is more likely to understand a warning message if it comes from an official source.
- Contradictory findings indicate that prior hazards experience may or may not be related to the propensity to understand a warning message.
- The clearer the warning message is, the more likely the public is to respond to the warning.
- The more consist a warning message is, the more likely the public is to respond to it.
- The more frequently a warning message is delivered, the more likely the public is to respond to it.
- The public is more likely to respond to a warning message if it comes from an official source.
- The public is more likely to respond to a warning message if the message comes from a credible source.
- The more specific a warning message is, the more likely the public is to respond to it.
- A person with children is more likely to respond to a warning message than someone without children.
- The more time there is to impact of a disaster, the less likely a person is to respond.

Quarantelli, E. L. 1984. .Perceptions and Reactions to Emergency Warnings of Sudden Hazards... Ekistics 309:511-515.

- The more specific the warning message is, the more likely the receiver is to believe it and/or understand it.
- If confirmation of the disaster/hazard happens, people are more likely to believe a warning message.
- A person is less likely to respond to a warning message if they have a fear of looting.
- If a person feels some personal efficacy, they are more likely to respond to a warning message.
- The more a person personalizes a warning message, the more likely they are to respond to it.

Riad, Jasmine and Fran H. Norris. 1998. "Hurricane Threat and Evacuation Intentions: An Analysis of Risk Perception, Preparedness, Social Influence, and Resources.

In the 5th wave of a panel study, Riad and Norris look at the threat of a hurricane and intentions to evacuate. The study looks at Charleston and Savannah and posits that potential influences of evacuation intention are risk perception, preparedness, social influence and economic resources. Due to the fact that this was the 5th wave of the study there are only 95 respondents in the study. Findings included:

- The more anxiety a person feels about an impending disaster/hazard, the more likely they are to believe a warning message.
- The greater the social influence, the more likely a person is to believe a warning message.
- Women are more likely than men to respond to a warning message.
- Black people are more likely to respond to a warning message than are non-blacks.
- There is no relationship between having children and responding to a warning message.
- A person is less likely to respond to a warning message if they have had prior hazards experience.
- If a person owns a home, they are less likely to respond to a warning message.
- If a person perceives an increased risk or loss, they are more likely to respond to a warning message.
- Someone who is experiencing low social embededness is more likely to respond to a warning.
- There is no relationship between a person's resources and their likelihood for responding to a warning message.
- The greater the social influence, the greater the likelihood of a person responding to a warning message.
- If a person feels some personal efficacy, they are more likely to respond to a warning message.

Riad, Jasmin K., Fran H. Norris, and R. Barry Ruback. 1999. "Predicting Evacuation in Two Major Disasters: Risk Perception, Social Influence, and Access to Resources." Journal of Applied Social Psychology 29 (5): 918-934.

The complex and somewhat bewildering phenomenon of why people sometimes decide not to evacuate from a dangerous situation is influenced by a combination of individual characteristics and three (3) basic social psychological processes: (a) risk perception, (b) social influence, and (c) access to resources. This study used a combined sample of 777 adults interviewed after Hurricanes Hugo and Andrew. Although numerous variables significantly predicted evacuation, much variance in behavior still remained unexplained. Different population subgroups gave different reasons for not evacuating (e.g. severity of the storm, territoriality). A multifaceted and tailored approach to both individuals and communities is needed; a simple warning is not enough.

Riad, Jasmin K., William Lee Waugh, Jr., Fran H. Norris. 2001. "The Psychology of Evacuation and the Design of Policy." In The Handbook of Crises and Emergency Management, ed. Ali Farazmand. New York: Marcel Decker.

The authors examine the design of evacuation policy and seek to make recommendations regarding the communication of information from public officials to the public. The authors present an excellent review of the literature, which will now be summarized into stable and unstable results.

- In numerous studies gender is a predictor of evacuation behavior with women being more likely to evacuate.

Moreover, women are also more likely to perceive a disaster event as a threat or as risky. The authors suggest that evacuation policy should attempt to be more inclusive to women thus potentially ensuring more evacuations occur.

- Another determinant of evacuation that has been stable is family. Family is often cited as a reason why people evacuate.
- Risk perception and stress are stable indicators of evacuation.

Those individuals who do not perceive risk will not evacuate. In fact, Riad and Norris (1998) find that high perceived risk (measured using a 10 question battery of occurrences that would make them evacuate) was the most important variable in evacuation intention.

- Psychological effects of predictions have consistently been linked with the use of heuristics.

Heuristics can cause individuals to correctly or incorrectly predict what may happen. This reliance on heuristics is especially true during times of uncertainty and is part of the cognitive miser aspect of humans. The use of heuristics can cause biases because of limited information and this may lead to improper risk assessment.

- Another stable component of determining evacuation behavior focuses on knowledge and terminology. This focuses on an individual's lack of knowledge concerning terms like "warning" or "watch". This lack of proper information creates a scenario where individuals are making decisions based on misperceived information.
  As knowledge increases we should expect that more "right" decision will be made.
- Another stable predictor of evacuation behavior focuses of social influence and support and in this realm increased social support is correlated with evacuation.

The logic behind this lies in the fact that support is often times done through networks and involvement in social networks increase knowledge.

- The last stable indicator discussed by the authors is previous evacuation behavior. If individuals had prior experience then this increases the chance they will evacuate in the future.
- Unstable predictors include ethnicity, resources, territoriality, having children and having pets. In each case the evidence was mixed and was not stable over either time or space.

The authors also point to the fact that there needs to be some focus placed on the community level and that focus on the individual level only creates an incomplete perspective in regards to evacuation policy. Some issues at the community level that matter are population growth, consistent evacuation policies, media influences, technology, mitigation, emergency management responsibility, resources, and power, legal issues, vertical evacuation, special-needs populations, collective evacuation decisions, and evacuation policy. With these factors established, the author stresses that a dual level approach is needed in order to reduce the loss of life during disasters.

Riad, Jasmin K. And Fran H. Norris. 1998. .Hurricane Threat and Evacuation Intentions: An Analysis of Risk Perception, Preparedness, Social Influence and Resources... Newark, DE: Disaster Research Center, University of Delaware.

Rincon, Elizabeth, Marc Y-R Linares, and Barry Greenberg. 2001. Effect of Previous Experience of a Hurricane on Preparedness for Future Hurricanes. American Journal of Emergency Medicine 19 (4):276-279.

- Only 37% of the families that experienced hurricane *Andrew* would go to a shelter versus 49% for the families that did not (P< .05).
- It was concluded that we can safely reject the hypothesis that having experienced a major hurricane will promote better preparedness for future ones.
- Those who experienced hurricane *Andrew* were less willing to go to a shelter compared with the group that did not.

Rogers, George O. 1985. Some Policy Implications of Human Components of Emergency Warning. Pittsburgh, PA: Center for Social and Urban Research, University of Pittsburgh.

- The older a person is, the less likely they are to hear a warning message.
- The public is more likely to believe a warning from an official source.
- The greater a persons perceived risk, the more likely they are to believe a warning message.
- The more consistency with which a warning message is delivered, the more likely the receiver is to understand it.
- The more frequently a warning message is delivered, the more likely the receiver is to understand it.
- A person is more likely to understand a warning message if it is sent via multiple channels.
- A person is more likely to confirm a warning message if they have hazards knowledge.
- A person is more likely to confirm a warning message if they have heard it.
- The public is more likely to respond to a warning message if it comes from an official source.
- The more specific a warning message is, the more likely the public is to respond to it.
- If a person has knowledge about a protective response, they are more likely to respond to a warning message.
- A person with membership in social networks is more likely to respond to a warning message.
- Having confirmation of the disaster/hazard increases the likelihood of a person responding to it.

Rogers, George O. 1989. Communication of Emergency Warning: A Cyclical Process. Disaster Management 1:23-32.

In this article, the author asserts that conceptually emergency warnings are cyclical and composed of a four interdependent phases: 1) hazard detection; 2) hazard assessment; 3) warning transmission; and 4) response. People and organizations face potential obstacles to effective communication as they enter the waning process. Because people are integral links in the warning process, technological warning systems alone are unlikely to disseminate warning effectively. For communication of emergency warning to be effective, people have to be integrated into the process.

Rogers, George O. 1992. Aspects of Risk Communication in Two Cultures. International Journal of Mass Emergencies and Disasters 10:437-464.

When people from two distinct cultures attempt to communicate, they often fail to share the fundamental foundation upon which to establish meaningful two-way communication (e.g.: language and belief). Risk communication under such circumstances demands special attention; extra effort on the part of people from both cultures to understand and appreciate the risks from a comprehensive perspective that accommodates both sets of interests. This paper examines the communication about risk between the U.S. Army and the native Polynesian cultures in the Pacific Ocean. Specifically, the article analyzes the written record of the proceedings to comply with the *National Environmental Policy Act of 1969* that led up to the shipment of the European Stockpile of unitary chemical weapons to Johnston Atoll that was completed November 1990. The analysis indicates that while both the native cultures and the Army spoke the same language, the U.S. Army and the native cultures failed to communicate about the risks associated with the movement and destruction of weapons. They failed to establish risk communication dialogue, and never established a common framework for effective risk communication. The people involved from all groups did not establish a shared meaning, and no dialogue was established to clarify meaning as misunderstandings occurred. This condition contributed to increased distrust, and undermined the credibility of both perspectives.

Satler, David N. “Repeated Exposure to Hurricanes and Willingness to Evacuate: Implications of the Hurricane Floyd Experience.

This study looked at implications of Hurricane *Floyd* and found that the biggest issue was the non-reversal of lanes by the South Carolina Department of Transportation (DOT). However, results of the study show that even though the Hurricane *Floyd* experience was stressful, there were still a significant percentage of people who would evacuate if another Category 4 storm threatened the area. The survey was of 181 Charleston, SC residents chosen randomly from the telephone book.

Satler followed Perry’s model of evacuation behavior which posits that evacuation behavior is influenced by warning confirmation, warning source credibility, warning content, perceived risk, possession of an adaptive plan, and family context (Perry and Mushkatel, 1984). The study does not provide an instrument for the measurement of perceived risk, but does establish that previous behavior is associated with people’s perception of risk.

Scanlon, Joseph and Alan Frizzell. 1979. .Old Theories Don’t Apply: Implications of Communication in Crisis. Disasters 3(3):315-319.

Seydlitz, Ruth, J. William Spencer, and George Lundskow. 1994. .Media Presentations of a Hazard Event and the Public’s Response: An Empirical Examination.. International Journal of Mass Emergencies and Disasters 12:279-301.

Simpson, Robert H. And Herbert Riehl. 1981. The Hurricane and Its Impact. Baton Rouge, LA: Louisiana State University Press.

Sims, John H. And Duane D. Baumann. 1972. .The Tornado Threat: Coping Styles of the North and South.. Science 176:1386-1392.

Sitkin, Sim B. And Laurie R. Weingart. 1995. "Determinants of Risky-Decision-Making Behavior: A test of the Mediating Role of Risk Perceptions and Propensity." The Academy of Management Journal, 38 (6): 1573-1592.

- Two hypotheses focus on the characteristics of the storm: 1) The South experiences more tornadoes at night, and thus the public is less frequently prepared; 2) the South has more severe and deadly storms.
- The other set of hypotheses focus on differences in the human environment: 1) the construction of the buildings in the South is less durable than in the North; and 2) there are significant differences in the warning systems of the North and the South and/or response behavior of Northerners and Southerners.
- The authors conclude that southerners are more fatalistic, have less faith in the efficacy of their own actions and have less trust in society's warning system and that psychological factors resulting in failure to take effective action cause higher tornado death rates in the South. If a person feels some personal efficacy, they are more likely to respond to a warning message.

Sjoberg, Lennart. 2000. "Factors in Risk Perception." Risk Analysis. 20 (1): 1-11.

The author searches for an explanation of risk perception. He outlines prominent approaches and posits his own explanation. Common explanation focus on technical risk estimates, heuristics and biases and media content. One prominent model is the psychometric model, but this only explains 20% of the variance.

- The author proposes a model which utilizes attitude, risk sensitivity, and specific fear.
- He finds that this model accounts for over 30-40% of the variance and encompasses a different type of psychological explanation.
- One potential implication involves a different approach to the relationship between attitude and perceived risk.

Slovic, Paul. 1987. "Perception of Risk." Science, 236 (4799): 280-285.

Slovic frames his discussion within the context of humans being able to sense and avoid harmful environmental conditions. With this established, the author seeks to aid in risk analysis and policy-making. Risk perception was spawned from the psychological research on probability assessment, utility assessment, and decision-making processes.

These biases include framing effect of media coverage, difficulties with probabilities assessment, misleading personal experiences and anxiety created by life experiences. In the end, the author seems to posit that information given to citizens regarding risk or potential risk need to be delivered in multiple contexts in order to ensure the public's response.

Slovic, Paul, Howard Kunreuther, and Gilber F. White. 2000. "Decision Processes, Rationality and Adjustment to Natural Hazards." In The Perception of Risk. London: Earthscan Publications Ltd.

The authors cite that there is a significant amount of misjudging of natural disasters. Along these lines Slovic et al. identify that "technical experts" and "flood plain dwellers" both underestimate the likelihood of recurrent natural disasters. The authors also find that decision makers, whether policy makers or "lay" individuals exhibit limited awareness of alternatives and tend to misperceive "probabilistic events and employ numerous mechanism to reduce uncertainty and avoid dealing with it", mainly the common heuristics found elsewhere in the literature.

The authors suggest using decision analysis to better adjust personal, political and technical responses to natural hazards.

Slovic, P., B. Fischhoff, and Sarah Lichtenstein. 1981. "Perceived Risk: Psychological Factors and Social Implications." Decision Research, 376 (1764): 17-34.

Begins with the assumption that subjective judgments are a major component in any risk assessment and from this point focuses on characterizing what perception of risk is. According to the authors perception is key. Intricate to perception is a network of heuristics that citizens utilize to differing degrees. As noted elsewhere, the availability heuristic is one potential strategy. The likelihood of an event occurring increases with the availability of information.

- Linked to this heuristic is the Biased Media coverage heuristic. In this case biased media statements or the distorted focus on hazards make the public perceive events as more likely.
- Moreover, some use the fact that it has not happened to them as part of their decision-making process. This can cause severe misconceptions of risk and provide distorted risk assessments.
- Other problems can be created when a person believes that they know with certainty that an event will occur or not occur, and this certainty leads to misperceptions.
- In this realm the use of heuristics have become prominent within individuals, however many of these heuristics introduce biases regarding risk assessment.
- The availability hypothesis implies that any facto that makes a hazard highly memorable or imaginable—such as a recent disaster or a vivid film or lecture—could considerably increase the perceived risk of that hazard.

A final problem can be created by overconfident experts that relay unreliable information to the public. In the end the author establishes that a theory of perceived risk "must explain people's extreme aversion to some hazards, their indifference to others, and the discrepancies between these reaction and experts' recommendations (22)."

Sorensen, John H. 1991. When Shall We Leave? Factors Affecting the Timing of Evacuation Departures. International Journal of Mass Emergencies and Disasters 9 (2):153-165.

- There is no relationship between age or a person being older in age and the likelihood of a person responding to a warning message.
- There is no relationship between a persons' geographical proximity to a disaster and their likelihood for responding to a disaster.
- There is no relationship between the size of a persons' family and their likelihood for responding to a warning message.
- The less time there is to impact of a disaster, the less likely a person is to respond.

Sorensen, John H. and Dennis S. Mileti. 1987. .Decision-Making Uncertainties in Emergency Warning System Organizations. International Journal of Mass Emergencies and Disasters 5:33-61.

- The major decision making uncertainty classes identified in this review were: (1) ability to interpret the impending event; (2) communications; (3) perceived impacts of the warning and (4) exogenous influences.
- Primary problems have been recognition of the hazardous event and physical ability to communicate information with others in the chain of warning dissemination.
- It is concluded that decision making uncertainty, at all levels of stages of warning systems, has been a major constraint to warning effectiveness and would well be a prime object to be mitigated by future warning system preparedness activities.

Sorensen, John H. and Dennis S. Mileti. 1988. Warning and Evacuation: Answering Some Basic Questions. Industrial Crisis Quarterly 2:195-209.

In this paper the authors address five questions that are frequently asked in the context of emergency planning for various accidents and disasters. These questions are commonly voiced by emergency managers or planners wanting a better basis for developing emergency response plans. The questions are frequently answered by people who have an image of how people behave in an emergency; often, however, their observations are inaccurate and misleading. The questions are as follows. First, how long does it take to warn a population about a crisis? Second, how many people evacuate in an emergency situation? Third, when do people evacuate? Fourth, do people evacuate unnecessarily? Fifth, where do people go when they evacuate? The major findings are as follows. First, most emergency response systems which typically consist of law enforcement, fire fighting and other civic employees, and sometimes volunteers, coupled with emergency use of available electronic media can issue an effective warning given three or four hours of lead time. In some situations, when the threat is urgent, a warning can be disseminated in a much more rapid fashion. In situations with less than one hour of available warning time, some, and perhaps a substantial portion of the population will not receive a warning. Second, the speed of warning dissemination, particularly in urgent situations, is increased by informal warning processes. People seek information following the receipt of the warning and one common way to do so is to contact friends, relatives or neighbors. In some of the situations studied, 50% of the initial warning was attributable to informal notification processes. Third, when advised or ordered to take a protective action such as evacuation, few people respond instantaneously except when there is a recognized and immediate threat. The length of time it takes for people to respond is variable among events, depending on the available time to impact and the severity of the threat. In any event, people are unlikely to take action simultaneously; rather it will be spread out over time.

Sorensen, John and Dennis Mileti. 1991. "Risk Communication in Emergencies." Pp. 367-392 in Communicating Risks to the Public: International Perspectives, edited by R. E. Kasperson and J. M. Stallen. Boston, MA: Kluwer Academic Publishers.

Despite the obvious linkages between pre-emergency risk communication and emergency risk communication, little has been done to compare the two or to examine how lessons learned about one activity can improve the other. Furthermore, risk communications research has done little to tap these bodies of knowledge. This chapter attempts a more systematic approach to examining risk communication as related to emergencies and disasters. This chapter defines each communication activity, reviews alternative modes of communicating risk information, and their strengths and weaknesses, reviews major research findings on each process, and summarizes the implications for improving risk communications in general.

Stallings, Robert A. 1991. .Ending Evacuations.. International Journal of Mass Emergencies and Disasters 9:183-200.

There is little research describing the process by which organizations decide to issue the "all-clear" to terminate an evacuation and of the process by which evacuated families decide to return to their homes. These processes are inherently more problematic in evacuations triggered by chemical or radioactive agents than is usually the case in evacuations occasioned by natural disasters. This paper presents some examples of toxic chemical evacuations as background for an examination of the process of terminating evacuations. The "all-clear" message and the pre-disaster warning message are taken as analogous, as are the decisions to evacuate and to return. Variables that research has shown explain warning and evacuation behavior are evaluated in relation to the all clear and return. Ending evacuations where toxic agents are concerned are more problematic because there is greater conflict that in turn lessens the credibility of all clear messages. Both the sources of these differences and their consequences are explored.

Thomas, Kerry. 1981. "Comparative Risk Perception: How the Public Perceives the Risks and Benefits of Energy Systems." Proceedings of the Royal Society of London, Series A, Mathematical and Physical Sciences, 376 (1764): 35-50.

Risk perception is focused on individual feelings concerning the outcomes of a risk issue. Included in risk perception is the trade off that exists between risk and benefit. The author examines perception of risk and the subjective nature of the issue. She then utilizes a survey of beliefs and attitudes of the public toward the use of various energy systems.

- The author begins with the assumption that risk perception is an idiosyncratic process that attempts to make sense of a complex world in order to facilitate decision making and structure behavior.
- She utilize Tversky's (1974) concept that an individual's interpretation of the consequences is a core concept of risk perception.

Perception of a risk will be a function of how a person defines and hence feels about an outcome. An individual's perception of risk is not done in isolation. It incorporates their wider set of beliefs and risks and the potential impact on their life. Risk is factored into a cost benefit analysis scenario where potential benefits of the outcome of the risk are weighted against the costs associated with taking the risk. The author goes further and links risk to attitude theory. In doing so he factors a person's feelings into the risk-benefit analysis. The author uses surveys of the Austrian public and finds that the public "appears to conceive risk issues in differentiated terms, taking into account several substantive dimensions, which include probable benefits as well as unpleasant outcomes (48)." Furthermore, the concept of risk-benefit analysis is found in the fact that at least these two dimensions were present in the majority of issues.

Thompson, Kimberly M. 2002. "Variability and Uncertainty Meet Risk Management and Risk Communication." Risk Analysis 22(3): 647-654.

The author analyzes from a risk assessment and communication standpoint the shift toward using probabilistic risk analysis techniques and a shift away from point estimates. The article addresses the struggle by risk managers in dealing with distributions in decision making. The author asserts that this shift has had an effect on both risk analysis and communication.

- National Research Council (NRC) that variability and uncertainty have different ramifications.
  - Uncertainty forces risk managers to "judge how probable it is that risks will be overestimated or underestimated for every member of the exposed population", whereas Variability forces risk managers to "cope with the certainty that different individuals will be subjected to risks both above and below any reference point one chooses"
  - Risk managers must now figure out how to use distributions in the decision-making process instead of comparing a single point estimate to "bright lines" of risk.
  - This has also been difficult for risk communicators in that the probability of zero risk for everyone is rare and this makes communication more difficult.

Treadwell, Mattie E. 1962. .Hurricane Carla: September 3-14, 1961. Denton, TX: Office of Civil Defense Region 5, U.S. Government Printing Office.

This report summarizes the emergency response process of several counties and municipalities in Louisiana and Texas as related to the events associated Hurricane *Carla*, September 3rd. 14th, 1961. The report gives a detailed account of the events in a systematic description of the warning, various evacuations, the reception and sheltering of evacuees, the emergency organizations responses and equipment, evacuee re-entry and the rehabilitation of and recuperative abilities of the affected areas.

Vogt, Barbara M. 1990. .Evacuation of Institutionalized and Specialized Populations.. Oak Ridge, TN: Oak Ridge National Laboratory, U.S. Department of Energy.

This volume assesses the needs of institutions caring for people who require special consideration during evacuations. Over a four-year period, media accounts identified 1024 events where such evacuations occurred. The evacuations were grouped under four types of institutions: hospitals, educational facilities, correctional facilities, and nursing homes and related care facilities. A fifth category was identified for future study that includes miscellaneous facilities, such as workplaces, apartments, and places occupied by transient populations. Following introductory chapters that discuss the theoretical and practical considerations involving institutional evacuation, the author describes the data collection method and then presents findings and conclusions from the study. These findings include 1) the effectiveness of an evacuation (as measured by time to evacuate) appears limited by inter-organizational constraints; 2) the issues surrounding role abandonment among health care providers is largely dispelled by the continuity of care for clients; and 3) it appears that institutional populations are protected in emergencies by the adaptiveness of their organizations and not by formal planning nor by efforts of local communities.

Vogt, Barbara M. 1991. .Issues in Nursing Home Evacuations.. International Journal of Mass Emergencies and Disasters 9 2):247-265.

Both emergency planners and disaster researchers cite the lack of empirical data on the problems and needs of special populations during emergency evacuations. Although most evacuations of nursing homes and related care facilities are carried out successfully, the effectiveness of an evacuation (as measured by time to evacuate) appears limited by certain constraints. Among the factors affecting such evacuations are resources (such as the number of staff available at the time of the evacuation), type and number of clients, and community characteristics such as population density. This study describes selected organizational characteristics of nursing homes and related care facilities that have recently experienced either a partial or complete evacuation of their facilities. After discussing the theoretical aspects of organizations in evacuations and the methodology used for the study, the study discusses both the quantitative and qualitative factors affecting organizational behavior during evacuation. It is evident from the findings that the continuity of responsible care for clients is of critical concern to both management and staff during an evacuation. The findings suggest that individuals within specialized populations are unlike other disaster victims and may require different management strategies on the part of agencies assisting in the evacuation.

Westgate, Kenneth. 1978. .Hurricane Response and Hurricane Perception in the Commonwealth of the Bahamas.. Mass Emergencies 3:251-265.

Whitehead, John C. Et al. 2000. "Heading for Higher Ground: Factors Affecting Real and Hypothetical Hurricane Evacuation Behavior." Environmental Hazards, 2: 133-142.

Using Hurricane Bonnie survey data as well as data regarding a hypothetical hurricane the authors examine the social, economic, and risk factors that affect the decision to evacuate. Using survey data the author attempts to capture what impacts decisions to evacuate. After reviewing the literature, the authors detailed the survey design and findings. Important within this research was the hypothetical aspect in that the authors attempted to capture future evacuation behavior. The hypothetical aspect was captured using the following scenario: "Respondents were told that Hurricane *Bonnie* was a Category 3 hurricane and then asked hypothetical questions concerning a future hurricane with randomly assigned storm intensity…"

Whitehead, John C. Forthcoming. "One Million Dollars per Mile? The Opportunity Costs of Hurricane Evacuation," Ocean and Coastal Management.

This paper analyzes the cost of evacuation and seeks to pursue a better measure than the "one million dollar a mile" estimate that is prevalent within evacuation literature. The author utilizes individual level survey research of households in North Carolina that evacuated during Hurricane *Bonnie* in 1998. Although this article does examine the cost of evacuation, the author does note that cost is a secondary concern to citizens' well-being. In regards to the accepted "one million dollars a mile" standard the author notes that this does not incorporate storm intensity, behavior, and population of evacuated areas.

- The author discusses a theory of evacuation behavior and assumes that health and income are important considerations for households, and that the choice is binary, either evacuate to someplace safer or stay at home.

Associated with evacuation are costs such as transportation costs, food, lodging, as well as other expenses. He posits that evacuation costs are a function of distance and income. The respondents to the survey were asked questions about evacuation behavior during Bonnie, as well as about hypothetical future hurricanes of differing in intensity, location, and evacuation orders. In the end the author finds that the cost of evacuation according to his data was much less than the "one million dollar a mile" standard.

- Whitehead finds that previous evacuation behavior, costs of evacuation, and risk perception concerning wind and flood are important determinants of evacuation behavior.

Whitehead, John C. Forthcoming. "Hurricane Risk Perceptions and Preparedness." In book chapter.

Whitehead considers the relationship between wind and flood risks perceptions and hurricane preparedness using panel data. Data includes surveys conducted after Hurricanes *Bonnie* (1998), *Dennis* and *Floyd* (1999). The author attempts to understand the factors that encourage people to disregard recommended guidelines. According to the extant literature, evacuation behavior determinants include: measures of objective and subjective risk factors (Baker, 1991), not feeling safe at home (Dow and Cutter, 1997), residing in a mobile home (Baker, 1991; Whitehead et al. 2000), storm intensity (Whitehead et al, 2000), and actual damages (Riad, Norris, and Ruback, 1999). The author used a two-stage model to determine hurricane preparedness.

Whitehead, John C., Bob Edwards, Marieke Van Willigen, John R. Maiolo, and Kenneth Wilson. 2001. "Hurricane Evacuation Behavior of Coastal North Carolina Residents during Bonnie, Dennis, and Floyd," Chapter 9 in Facing Our Future: Hurricane Floyd and the Recovery in the Coastal Plain, ed. Maiolo, John R., John C. Whitehead, Monica McGee, Lauriston King, Jeffery Johnson, Harold Stone. Wilmington: Coastal Carolina Press.

Wilkinson, Kenneth P. and Perry J. Ross. 1970. .Citizen Response to Warnings of Hurricane Camille. Starkville, MS: Social Science Research Center, Mississippi State University.

- The older a person is, the less likely they are to respond to a warning message.
- The more experience a person has with disasters/hazards, the less likely they are to respond to a warning message.
- A person with children is more likely to respond to a warning message than someone without children.
- A person with membership in a minority group is less likely to respond to a warning message.
- The greater the social influence, the greater the likelihood of a person responding to a warning message.
- Understanding a warning message increases the likelihood of responding to it.

Williams, Harry B. 1957. .Some Functions of Communication in Crisis Behavior.. Human Organization 16:15-19.

This article examines human behavior in one type of crisis: sudden community disaster. Using the feedback control system in hope of generating some insights on the subject; a full examination of human behavior in disaster requires other points of views and models. The general function of communication in crisis to provide the actor with information that will enable him to make choices and avoid, minimize or remedy the consequences of the crisis. Eight hypotheses are advanced: 1) Information about a future possible threat, which has not been previously experienced, tends to have relatively low value. 2) Recognition of the existence of crisis tends to follow an emergent or non-linear pattern. 3) Information about survival choices is a major determinant of survival behavior. 4) Compelling pressure to act and a compressed time perspective lead to error. 5) Sudden crisis creates great disparity between input from the environment and reference input, cutting down output. 6) The sector of life subject to reference input through institutionalized channels and sources is radically reduced. 7) There is great need for assistance in the communication and decision-making process. 8) Crisis events need to be interpreted and re-integrated with the actor's value system.

Windham, Gerald O., Ellen I. Posey, Peggy J. Ross, and Barbara Spencer. 1977. .Reaction to Storm Threat During Hurricane Eloise. Starkville, MS: Social Science Research Center, Mississippi State University.

- The public is more likely to respond to a warning message if it receives that message from the mass media.
- The public is more likely to respond to a warning message if it comes from an official source.
- The more experience a person has with disasters/hazards, the less likely they are to respond to a warning message.
- If a person has knowledge about a protective response, they are more likely to respond to a warning message.
- A person with membership in social networks is more likely to respond to a warning message.
- The greater a persons' perceived risk or loss, the more likely that person is to respond to a warning message.
- The greater the social influence, the greater the likelihood of a person responding to a warning message.
- Understanding a warning message increases the likelihood of responding to it. The more a person personalizes a warning message, the more likely they are to respond to it.

Withey, Stephen B. 1962. .Reaction to Uncertain Threat.. Pp. 93-123 in Man and Society in Disaster, edited by G. W. Baker and D. W. Chapman. New York, NY: Basis Books.

- The more consistency with which a warning message is delivered, the more likely the receiver is to believe it.
- If confirmation of the disaster/hazard happens, people are more likely to believe a warning message.

Withey, Stephen B. 1976. .Accommodation to Threat. Mass Emergencies 1:125-130.

- If a person has knowledge about a protective response, they are more likely to respond to a warning message.
- The more a person personalizes a warning message, the more likely they are to respond to it.

Wolensky, Robert P. & Kenneth C. Wolensky. 1991. "American Local Government and the Disaster Management Problem," Local Government Studies (March/April): 15-32.

- This article focuses on two questions: "What has been local government's record in managing the demands associated with major disasters, and what explanations have been offered for any problems encountered?" (pg. 15)
- They study local government performance at four stages: "pre-disaster (mitigation and preparedness planning), emergency (immediate pre- and post-impact), short term recovery (up to ten years.)" (Pg. 15)
- In the pre-disaster period they find that "in many cases, officials and citizens do not understand the emergency management process nor the planning values underlying it." (pg 16)
- They also find that "because of poor leadership and bureaucratic and legal constraints, local government decision making lags well behind that of private organizations and businesses." (Pg. 18)
- They also find that "the historic development of power relationships within the American city has led to a custodial oriented and limited resources governmental sphere, along with an influential and well-resourced civic sphere. Minimalist government can therefore be viewed as the ideological outcome, and counterpart, of the American cultural disposition toward a strong and independent non-governmental realm. In any American city, private (especially business) interests can be expected to wield considerable influence across a range of issues, disaster management included. Given the clear preference among these groups for market based processes of land use determination as well as their general distaste for government intervention, it is easy to see why effective disaster management has not prospered." (Pg. 25)

Wolshon, Brian, Elba Urbina and Marc Levitan. National Review of Hurricane Evacuation Plans and Policies. 2001 LA Hurricane Center.

- This study includes a survey that was sent to emergency management, DOT, and law enforcement officials in every at-risk coastal state in the continental U.S. This study is an analysis and survey of the transportation aspect of evacuations.
- "Many people resist being ordered to leave their homes and property by government officials." (pg 16) Prior research has shown that people who said they heard mandatory evacuation orders are the most likely to evacuate; while recommended evacuation orders are met with les urgency (PBS&J, 200b)" (pg 17). The type of evacuation and the order given is also important to "avoid necessary evacuation" or "shadow evacuations" in which people who are not necessarily in danger evacuate because of their nearness to the threatened areas (Pg. 17)

International Journal of Mass Emergencies and Disasters

Aguirre, B.E. "Evacuation as Population Mobility." *International Journal of Mass Emergencies and Disasters*. Vol. 1 November 1983. 415-438.

Atwood, L. Exploring the "Cry Wolf" Hypothesis. Vol 16. November 1998.

Blanchard-Boehm, R. Understanding Public Response to Increased Risk from Natural Hazards: application of the Hazards Risk Communication Framework. Vol. 16 November 1998.

Comfort, L. Et al Time, Knowledge, and action: The Effect of Trauma Upon Community Capacity for Action. Vol 16 MRCH 1998.

Dynes, R. Community Emergency Planning: False Assumptions and Inappropriate Analogies. Aug. 1994 Vol. 12, No. 2.

- Emergencies may create some degree of confusion and disorganization but NOT social chaos.
- Emergencies do NOT reduce the capacity of individuals and social structures to cope.
- Emergencies may present new and unexpected problems to solve.
- Existing social structure is the most effective way to solve these problems.
- To create an artificial emergency-specific authority structure is neither possible nor effective.
- Planning efforts should be built around the capacity of social units to make rational and informed decisions.
- These social units need to be seen as resources for problem solving, rather than as problems themselves.
- That an emergency, by its very nature is characterized by decentralization and pluralistic decision making, so autonomy of decision making should be valued, rather than centralized authority.
- That an open system be created in which a premium is placed on flexible and initiative among the various social units, and then those efforts are coordinated.
- The goal should be towards problem solving, rather than on chaos avoidance.
- The problem solving model assumes that the resources from the pre-emergency community are relevant and sufficient.
- The problem solving model does NOT assume that what is needed is a top down, rigidly controlled and highly centralized pattern of social organization.
- The key is to develop mechanisms for integrating the emergent and convergent activities which are necessary to solve the problems.

De Silva, F. Designing a Spatial Decision Support System for Evacuation Planning. Vol 20 March 2002.

Enarson, E. Women and Housing: Issues in Two U.S. disasters; Case Studies from Hurricane Andrew and the Red River Valley Flood. Col.17 November 1999.

Fothergill, A. "Gender, Risk, and Disaster" *International Journal of Mass Emergencies and Disasters*. Vol.14. 1996

Garrison, J. Mental Health Implications of Disaster Relocation in the United States: A Review of the Literature Vol. 3 August 1985.

Gladwin, C. Modeling Hurricane Evacuation Decisions with Ethnographic Methods. Vol. 19 March 2000.

Heath, S. A Study of Pet Rescue in Two Disasters. Vol.18 November 2000.

Research shows that finding ways to evacuate pets (and live stock in some cases) can reduce premature (dangerous) re-entry into the disaster area by up to 80%. There is some evidence suggesting that encouraging people to plan to evacuate their pets increases the likelihood that they will evacuate.

Houts, P The Protective Action Decision Model Applied to Evacuation During the Three Mile Island Crisis. Vol. 2 March 1984.

Ketterridge, A. Flood Evacuation in Two Communities in Scotland: Lessons from European Research. Vol 16 August 1998.

Evacuation is a process with six identifiable steps:

1. Pre-flood preparedness,
2. The flood emergency,
3. Evacuation,
4. Accommodations,
5. Return, and
6. Recovery

Emergency planning should reflect all SIX. Warning and advice to evacuate must be targeted to specific groups to heighten credibility and effectiveness. Unofficial networks should be encouraged.

Nakagawa, Yuko "Social Capital: A Missing Link to Disaster Recovery." *International Journal of Mass Emergencies and Disasters*. March 2004. Vol. 22, No. 1. 5-34.

Phillips, Brenda D. "Cultural Diversity in Disasters: Sheltering, Housing, and Long-term Recovery." *International Journal of Mass Emergencies and Disasters*. Vol. 11. No. 1. March 1993. 99-110.

- Assess the impact of disaster potential including specific populations.
- Reassess the community disaster plan and other mitigation measures in light of what is found within a community's population.

- Bring members of potentially impacted populations into the planning process. A taskforce advisory is a start.
- Remember to plan for a long recovery.

Phillips, B. Women and Disaster: Vulnerabilities and Capacities.

Benefits of building capacity with, for, and by women include the following:

- Reduction of death and injury.
- More resources, labor, ideas and talents.
- New perspectives.
- Better mitigation.
- Fewer problems.

Recommendations include:

- Involve women in all phases and all levels.
- Identify categories of women without traditional sources of support.
- Develop programs that enable women to become professionals.
- Educate emergency manager about women's issues.
- Involve women in planning and policy making.
- Be aware of the effects of culture, religion, and development.
- Identify and use communication systems of women
- Ensure that women are fully represented on all committees.

Perry, R. And Lindell, M. 1991. The effects of ethnicity on evacuation decision-making. International Journal of Mass Emergencies and Disasters, 9(1).

The most consistent finding in our data is that older adults made decisions based on individual circumstances and personal experience. Unfortunately, experiences before, during, and after Hurricane *Floyd*, are likely to reinforce the notion that expert advice may be unreliable. Perhaps this is a consequence of how hurricane information has been presented to them. It is alarming to note that of the elders interviewed, 42.5% (N=71) reported that they saw no need to evacuate, as a category 5 storm approached our coast. Only 21% said that they paid attention to warnings or evacuation orders and left.

Ruch, C. Human. Response to Vertical Shelters "An Experimental Note" Vol.2 November 1984.

This issue has many articles related to evacuation and housing.

Soensen, J. Inter and Intraorganizational Cohesion in Emergencies. Vol.3 November 1985.

Stallings, R Evacuation Behavior at Three Mile Island. Vol. 2 March 1984.

Oak Ridge National Laboratory: Academic References

Baker, E. J. 1984 p41.

- The most variable affecting response was local officials' statements, regardless of whether probability information was available or not.

Baker 1980 p43.

- Not everyone will evacuate, even if ordered.
- Evacuation route capacity varies from 500-800 vehicles per lane per hour.
- Vertical evacuation problems encompass:
  [1] ascertaining the structures as safe,
  [2] over-crowding if option is publicized,
  [3] possible stranding evacuees from food and medical services,
  [4] possible roof failure.

Evacuation is enhanced through increased evacuation capacity, decreasing number of people who need to leave, limit population.

Baker and Carter 1984 p43.

- Decisions to evacuate during a hurricane threat are based on the perceived levels of benefits and the costs of evacuation by costal residents provided predominantly by the information received by the individual.
- Most important source of information is from local public officials.

Bates 1963 Hurricane *Audrey* p45.

- Reasons for NOT evacuating included lack of belief in seriousness of storm, conflicting media reports, unfamiliarity with extent and height of storm surge.
- Fritz's 'therapeutic community' is useful only in the immediate post-impact situation. Blacks suffer more death than whites.

Brinson 1980 Evacuation planning for coastal Georgia p46.

- Problems include lack of data regarding evacuation zones and rising water and high winds, lack of description of preplanned evacuation routes and the lack of knowledge concerning host and reception areas for evacuees.
- Corrections require extensive coordination between state, federal, and local officials.

Carter 1983 Household Response to Warning. p47.

- Single residents are less likely to respond to either official or unofficial statements irrespective of their perceptions of risk and to respond to their social contacts in considering evacuation.
- Married couples with children are much less likely to respond to social contacts and rely more heavily on their perception of risk.
- Couples without children and single residents are more likely to evacuate with no additional incentives, once having considered E, than couples with children.
- Single residents are more likely to evacuate on the basis of prior risk perception, than couples without children.
- Couples with or without children are more likely to evacuate based on their perception of flooding.

Chiu 1983 Hurricane *Iwa* p48

- Evacuation was hindered by:
  [1] Brief time between detection and warning.
  [2] Late issue of warning,.
  [3] Lack of alternative e routes.
  [4] Lack of information and coordination of provisions, shelters, including disputes about there use.
  [5] Lack of information of information to tourists.
  [6] Lack of backup electricity.

Christensen 1978 Assessment of brochures and radio and TV p50.

- Radio has little impact. Brochure increased accuracy of knowledge and TV spots enhanced belief in hurricane destructiveness.
- Residents who received brochures were significantly more prone to having a pre-planned evacuation route than those who did not receive a brochure (76% verse 59%).

Christensen 1980 Social Influence on Evacuation p49.

- Advisories issued by authorities had significant influence except for individuals with prior hurricane experience.
- Knowledge of surrounding activities was more important for these individuals.

FEMA 1984 Preparedness for local officials. P70.

- An effective E implementation elements - areas of risk, populations at risk, evacuation time, the hurricane evacuation decision system, and mutual aid agreements for implementing inter-jurisdictional evacuation assistance and coordination.

Forrest 1965 Hurricane *Betsy* New Orleans p54-56.

- ARC added shelters, training, liquid diet for first 24 hours to avoid cooking, and opened shelters 12 hours early.

Louisiana Department of Public Safety 1984 p55-56.

- Residents will depend on local government for advice and aid in the event of hurricane evacuation.
- Suggested factors affecting evacuation behavior include evacuation experience, vulnerability of home, number of vehicles owned and self-reported past evacuation experience.
- Those with hurricane experience are LESS likely to evacuate than those without but those with previous evacuation experience or who are novices are more likely to leave than those who never evacuate.
- Vertical evacuation gats mixed reviews.
- The majority of residents will be ready within 4 hours
- The majority of evacuees will go to friend or relatives followed by evacuation to ARC shelters.
- The vulnerability of home (personal vulnerability) contributes significantly to the decision-making process to evacuation.
- The proportion of owned vehicles used by the household for evacuation has positive relationship with the decision threshold.

Moore. Hurricane *Carla.* 1963 p56-57.

The study looked at the storm threat perceived by people and the action taken on the basis of the perceptions. The major objectives were to determine the effectiveness of the decision-making process of individuals and officials to take action, the coordination and effectiveness of disaster oriented agencies including voluntary ones.

- 90% reported getting information from radio and TV.
- Rural residents paid closer attention than urban.
- Women were more affected by warnings; Social economic status (SES) and ethnicity also associated with reaction to warnings.
- National Weather Service (NWS) cited as authority almost universally on warning. Evidence was clear that people did NOT base actions on advice from personal or trusted friends.
- When specific advice or orders issued, a larger proportion of people evacuated.
- When an evacuation plan was used more people were likely to evacuate. People believed people should be ordered to evacuate.
- Distance traveled from home to refuge associated with stage in family cycle; modal distance traveled less than 25 miles
- Percentage of people staying home increased with age.
- Females were more likely to evacuate than men.
- There was a direct effect between extent of evacuation and discussion outside family; “snowball” effect as neighbors conform to evacuate roughly coincided with ecological patterns in “naturally” hazardous areas.
- Families with income below $4,500 (1963) were more likely to evacuate homes but not hometowns.
- People evacuate as members of families or other groups, not as individuals, and decisions to evacuate are made by family, not as individuals.
- Previous evacuation experience associated with evacuation.
- Those with no perceived responsibility most likely to evacuation.
- ARC estimated that 206,103 persons stayed in 540 shelters; order of priority was private homes, commercial shelters, and lastly public shelters.
- Rumors, especially from media, were a problem following storm and resulted in increased anxiety causing premature return attempts.

Moore, 1964 Hurricane *Carla* p57-59 Comparisons between Parish TX and Chambers LA.

Disaster culture is the attempt residents make to deny or minimize danger and loss incurred.

- Recent disaster experience most important variable.
- Media played several roles: TV most important, radio second, newspapers third. Newspapers best in recovery time.
- Evacuee re-entry was a problem as sewage and portable water was unavailable after storm.
- Telephone calls increased prior to evacuation.
- Disaster culture hindered evacuation efforts and may prove lethal.
- Tornados were not expected.

Pinellas County Dept. Of Civil Emergency Services 1986 Hurricane *Elena*. P59-63.

Of 300,000 evacuees (38%) used ARC shelters, 19 nursing homes (1,860 residents) and 3 hospitals (211 patients). Evacuation special problems of nursing homes, hospitals, and special populations are discussed.

- Local programs based on regional planning are impacted by the National Hurricane Center (NHC) which does not consider local and regional plans when issuing warnings.
- A major problem for emergency managers was the governor's call for voluntary evacuation without coordination or knowledge of the county to open shelters.
- The large number of advisory committee hampered the notification of members and subsequent decision-making.
- Media present at executive meetings issued premature statements even when asked to wait by officials.
- Nursing homes, hospitals, and barrier islands were NOT appraised of ongoing decision-making process, although long-lead time is needed to evacuate these places.
- Law enforcement believed that the sale of alcoholic beverages contributed to problems in bars and shelters.
- Lack of coordination by local governments hampered re-entry.
- Hard copies of Executive Orders were not available to all concerned counties and hampered coordination between state and local officials.
- Only two or three cable systems were linked to the Emergency Broadcast System (EBS).
- In some cases, police and fire personnel evacuation areas not at risk.
- Some TV station gave wrong evacuation zone information after evacuation orders had been given.
- Local TV did not use script to warn hearing-impaired.
- No written script or pre-prepared agenda were on hand to cable over-ride system.
- Lack of forms by emergency operations center (EOC) staff hampered later retrieval of information regarding actions during emergency.
- Telephones were chief source of communication which reduced radio traffic and kept other agencies from remaining informed when tie-ups occurred in the system.
- Lack of representative of ARC prevented EOC from knowledge of sheltering problems in first 30 hours.
- Minimum staffing of EOC hampered re-entry.
- Communication support provided by 123 amateur radio operators at shelters, local government and other agencies, handling over 700 emergency messages. Some shelters remained without communications.

- No planned phone numbers for citizens to call regarding evacuation.
- Citizens not able to determine if they were in an evacuation zone.
- Conflicting information from media especially about bridge and road closings.
- Transportation from nursing-homes was uncoordinated both during evacuation and re-entry.
- Governor's advisory evacuation notice resulted in 2,000+ outside shelters prior to the shelters' opening.
- Shelter for more than 30,000 evacuees that planned for resulted in major feeding problems for ARC.
- No list of special needs evacuees were taken in shelters.
- Special needs evacuees NOT participating in the "Voluntary Registration Program" called multiple agencies for evacuation assistance which contributed to ambulance cancellation on arrival at destination sites.
- Most nursing homes evacuated with their own supplies, food and mattresses, utilizing pre-arranged transport or their own vehicles.
- Some buses dispatched to municipalities or nursing homes did NOT arrive or were delayed when local police commandeered buses for other uses.
- No facility was available to secure prisoners.
- Intraorganizational problems regarding control of National Guard.
- Critical workers and equipment were unable to move through road blocks.
- Persons did not always go to assigned shelters.

Ruch. 1981 Hurricane Message Enhancement P65.

- Using films on TV regarding possible damage of hurricanes should include information about tornadoes. People have reported that they fear tornadoes more than hurricanes.
- Most effective method of increasing safety response include hurricane material and testimony, information and fear.
- For those with prior hurricane experience, knowledge of activities of surrounding businesses and organizations is an effective variable in stimulating action.
- Action of strangers or friends did NOT have any significant impact of individual response.

Savage. 1984 Hurricane *Alicia* p66.

- Lack of shelters off of Galveston island appeared to discourage evacuation.

Simpson, 1980. Hurricanes and Coastal Storms. p68.

- Provisions must be made for in situ (in situation) relocation including vertical evacuation.
- Time is critical in determining the types of evacuation measures that can be taken by a community. Few communities have provided for the possibility of vertical evacuations.
- Vertical evacuation reduced evacuation time
- Vertical evacuation requires certification of structures and has problems of security, liability and the rights of individuals to refuse shelter to potential evacuees.

Simpson, 1981. The Hurricane and its Impact. p67-68.

- 9 out of 10 people who die in a hurricane had drowned.
- Massive relocation is sometimes NOT possible where locations are limited by long expanses of two lane roads, highways subject to flooding and wind, bridges and causeways, and residential development.
- In situ (in situation) evacuation procedures almost always contorted with political opposition having a wide range of motivation.

Sorensen, John Evacuation: An assessment of Planning and Research 1987(ORNL – 6376).

Organizational issues were found to be inadequate in the following areas:

- Lack of coordinated planning.
- Inadequate planning for shelters.
- Lack of plans.
- Lack of planning for secondary hazards.
- Definition of emergency planning zones (EPZ).
- Plans for institutional facilities and special population.
- Planning for re-entry.
- No support for planning.
- Planning for emergency resources for evacuees.
- Planning for medical and health care for evacuees.
- Planning for extended evacuations.
- Inaccurate evacuation time estimates.

Wilkinson. 1970 Citizens Response to Warnings Hurricane *Camille*. p71.

- The major factor that influenced the decision to evacuate was how dangerous the situation was defined.
- There is serious underestimation, especially with non-evacuators.
- The “spirit of defiance” characterized the “disaster culture.”
- Major difference between stayers and evacuees was how dangerous the personal situation was defined.

Vogt, Barbara Evacuation in Emergencies: An Annotated Guide to Research (ORNL/TM – 10277).

Vogt, Barbara Evacuation Research: A Reassessment (ORNL/TM – 11908) Culture and Ethnicity.

Culturally diverse groups within a majority group are less apt to follow the dictates of the majority officials. For some minority groups, lack of resources may prevent people from evacuating, while other groups require interpretation of warning messages to understand the hazard. P26

Factors Affecting Ability to Evacuate

Issues include economic resources and specialized groups – institutional groups and impaired populations. Having shelters available is one way to facilitate low-income persons' evacuating. One of the greatest problems in evacuating persons with special needs to identify these people. Some argue that knowing the location of disabled persons of groups will divert manpower to that location and away from the greater need. Others suggest that knowing the locations of these people make the work of emergency personnel easier and safer. P26-27

Organizational Issues

Major concerns of evacuation planning argue that:

1. Coordination of planning is lacking.
2. Planning for shelters is inadequate.
3. Planning for secondary hazards in needed.
4. Planning for institutional and special populations is lacking.
5. Planning for re-entry is needed.
6. There are no support planning – emergency resources to supply evacuees, health care, extended evacuation. P28

Inadequate planning for shelters

Shelter use is complex. Factors influencing shelter use are:

1. Socioeconomic status and age.
2. Length of time of evacuation.
3. Local hazards.
4. How for the hazard area extends.
5. Whether registration is necessary for financial compensation.

Health care is often inadequate and shelters are not open in timely manner, and they often need more basic equipment – chairs bathrooms. Many shelters are not intended to house large numbers for long periods of time. P31

Extended evacuation increases hardship on poor and unplanned burdens on shelter staff. P36