

## PRACTICAL RESEARCH IS AN ONGOING DISCOURSE OF UNCERTAINTY

David Perkes

*Director, Gulf Coast Community Design Studio*

Kristen Zeiber

*Intern Architect, Gulf Coast Community Design Studio*

**Mississippi State University  
College of Architecture Art and Design**

Architectural research within a design practice has different working conditions than conventional academic research. The activities of academic research are typically well-defined, independent from teaching activities and aimed directly at making knowledge. The activities of practical research are integrated into the work and are typically concurrent to parallel project activities that aim at making something useful such as a building or a neighborhood plan. The knowledge gained in practical research is in part a tool used for advancing the work of the practice and in part a byproduct of the design process. Practical research can be grouped into three general types according to different uses of the knowledge gained: research *for* practice, research *about* practice, and research *from* practice. In all three types, research is paired with practice. Furthermore, in all three cases the knowledge gained needs to be extracted and documented so that it can be shared and used beyond the project at hand. Without an extraction process practical knowledge remains internal to the project and, even though such knowledge educates the practitioner, it does not constitute research.

Research activities within a practice are often difficult to distinguish from design activities. This is because the knowledge-making activities and the documentation of the knowledge gained generally use the same tools and depend upon the same skills as those used in design. Nevertheless, research activities are often made to *appear* neatly packaged on either end of their employment: when they are described as future work for a proposal and when they are described as past work in a quarterly report.

However, even though successful proposals and reports rely upon such careful packaging, the actual activities of research in the day-to-day context of a design practice are not independent of the practice environment and often merge into the work of ongoing projects.

Likewise, questions that are relevant to a design practice are not easily packaged. There are two general reasons for this. First, the design *process* is non-linear and open-ended. Second, a design *practice* is shaped by physical science and social science, which both have a degree of uncertainty. This inherent uncertainty increases as questions expand from the performance of a single building to its impact on the environment. Uncertainty increases more as a single building design is expanded to a neighborhood plan or to large-scale planning and land-use policy. The design challenges of our time, addressing problems such as climate change and health risks from industrialization, are made of uncertainty and require us to learn to take into account not only those things we know, but also the things we don't know.

Research in the context of uncertainty is not a simple activity of replacing a lack of knowledge with knowledge, because some problems have uncertainty as a primary ingredient. These complex problems are part of practical research.

### Gulf Coast Community Design Studio work in East Biloxi, Mississippi



*Gulf Coast Community Design Studio workspace. Image © Alan Karchmer 2008*

The Gulf Coast Community Design Studio (GCCDS) has been working on the Mississippi Gulf Coast since Hurricane Katrina in a physical and social environment that is especially uncertain. The GCCDS is a program of Mississippi State University's College of Architecture, Art and Design, and has provided planning, architecture and landscape architecture services to many Gulf Coast communities and non-profit organizations since 2005. The GCCDS operates as a university research center with funding from grants and contracts for service. However, the day-to-day activities are not only research; they are a combination of research, teaching and practice.

The GCCDS full-time staff consists of a director, who is a licensed architect and Associate Professor, two planners, a landscape architect, and around ten architectural interns. In addition to sustaining a full-time professional staff, the GCCDS has organized three spring semesters with students and has employed both paid and volunteer summer interns. The GCCDS staff interacts daily with community members and workers of partner non-profit organizations.

Much of the work of the GCCDS is in East Biloxi, a low-income, racially-mixed part of Biloxi occupying a peninsula around one mile across and four miles long. The Gulf of Mexico is to the south and the Back Bay is to the north. The population of East Biloxi before Hurricane Katrina was around 10,000. In 2009 the East Biloxi population is estimated to be less than 7000 because of Hurricane Katrina's destruction. The storm surge inundated the entire East Biloxi end of the peninsula. Of the approximately 5000 houses, over half were destroyed and the other half of the houses were flooded.

The GCCDS has a unique opportunity to work in a context shaped by uncertainty. This is because Hurricane Katrina revealed that living on the Gulf Coast carries a higher risk than previously assumed, and because the unprecedented amount of collaborative and subsidized work following Katrina has created an unusual work environment. Both of these conditions have prompted the creation of new modes of practice that are well suited to work in a context of uncertainty by working beyond the limiting self-interests of private ownership. Hurricane Katrina increased the public awareness of environmental vulnerability, causing a type of forced enlightenment to the general population. There are more people organizing and attending "green" activities than in the past, and the discussions suggest that people are becoming increasingly concerned about sustainability

and resiliency. In such a context the GCCDS is inventing a type of subsidized practice that is able to work beyond the limiting self-interests of private ownership.

The subsidized work of the GCCDS in East Biloxi has evolved as new resources became available and as the work of various partners has changed. The evolution of the GCCDS illustrates three important general relationships between research and practice:

1. Research and practice can be combined into funded projects.
2. Research activities run parallel to practice activities.
3. To become research, knowledge should be extracted along the way.

The GCCDS has been successful at securing grants and contracts to support its work on the Gulf Coast. Since its establishment soon after Hurricane Katrina in late 2005, the GCCDS has received over three million dollars in external funding. The following chart shows a general overview of the grant and contract income for 2009.

## 2009 INCOME

(Approximate)

### FEDERAL GRANTS

HUD (Via MDA)	\$230,000	<b>52%</b>
Department of Energy	\$60,000	
Small Business Administration	\$50,000	
Dept. of Homeland Security	\$80,000	
Nat'l Endowment for the Arts	\$30,000	

### CONTRACTS

Biloxi Housing Authority	\$30,000	<b>29%</b>
Renaissance Corporation	\$110,000	
Back Bay Mission	\$30,000	
Hope Community Development	\$40,000	
Habitat for Humanity	\$20,000	
Other	\$20,000	

### PRIVATE GRANTS

\$110,000 **13%**

### UNIVERSITY

\$50,000 **6%**

**TOTAL** \$860,000

The initial funding that supported the establishment of the GCCDS was a HUD University Rebuilding America Partnership Grant (URAP). Soon after Hurricane Katrina, HUD announced a one-time grant opportunity for universities to work on the Gulf Coast. Mississippi State University was one of seven universities to receive a URAP grant. The grant was not only important financially to create the GCCDS, but also had two other outcomes. First, the URAP grant application led to a partnership between the East Biloxi Coordination Relief and Redevelopment Agency (since renamed the Hope Community Development Agency). Second, receiving the HUD grant gave the school's effort on the coast validity in the eyes of the university research office and proved to be an effective base from which to seek and receive other funding. The URAP grant and much of the other funding that followed have broadly defined scopes of work, a way of working which has enabled the GCCDS to provide a wide range of design services to low-income communities and non-profit organizations. The effectiveness of the GCCDS to combine research and practice has depended upon maintaining broadly defined funding to respond to evolving community needs and opportunities.

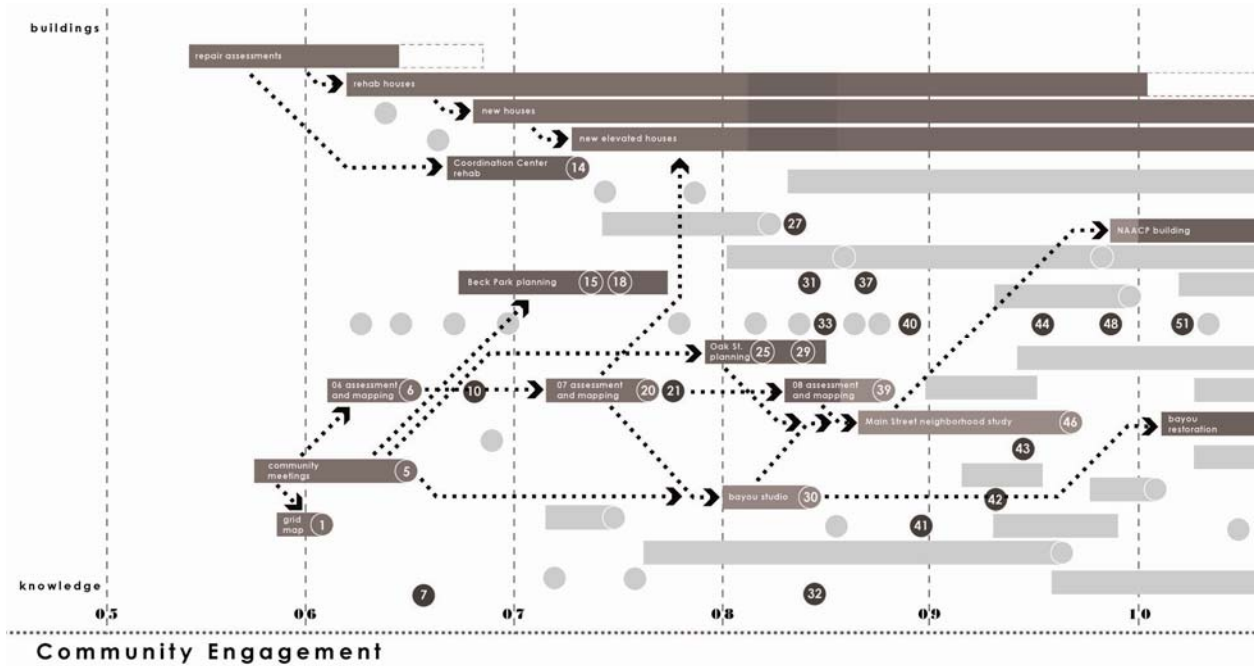
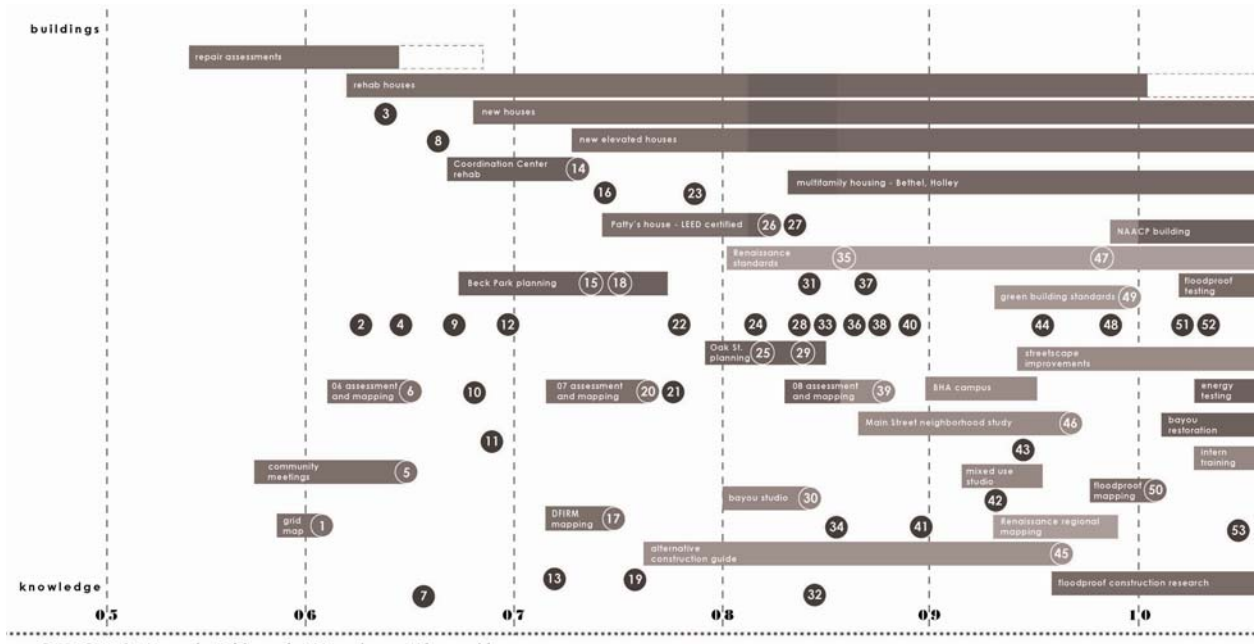
The planning and architectural design work in East Biloxi illustrate how research and community projects run parallel in a grant supported practice. The first diagram on the following page shows the projects that make up the GCCDS East Biloxi work. The diagram tracks projects over time, arranging the projects from those that produce buildings at the top to those that produce knowledge at the bottom. The projects are color coded by funding with outputs designated at they occur throughout. These outputs are activities such as community meetings, reports, publications, exhibits, and presentations that are used to extract and disseminate knowledge gained from the work. There are two target audiences for such outputs. In some cases the audience is the local community, which benefits from information and guidance to help address local problems. In other cases, the audience consists of professional and academic groups that are reached through journal publications, conference presentations, and invited lectures. The GCCDS website serves as a medium for both audiences.

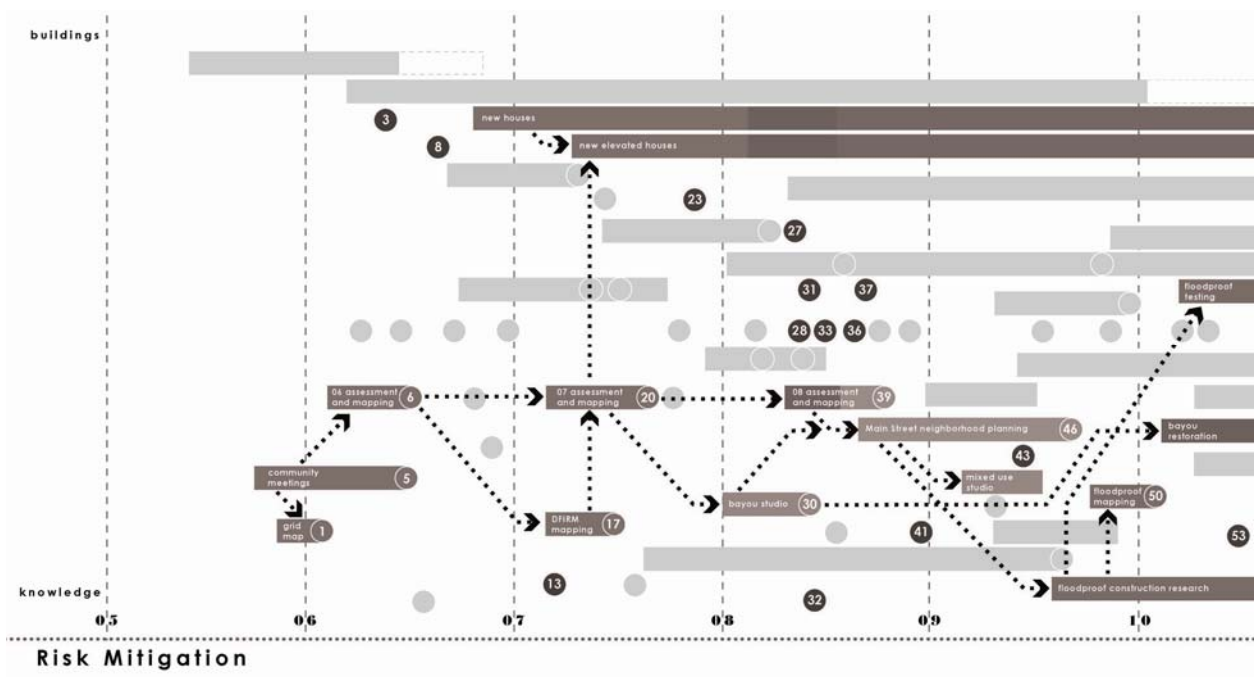
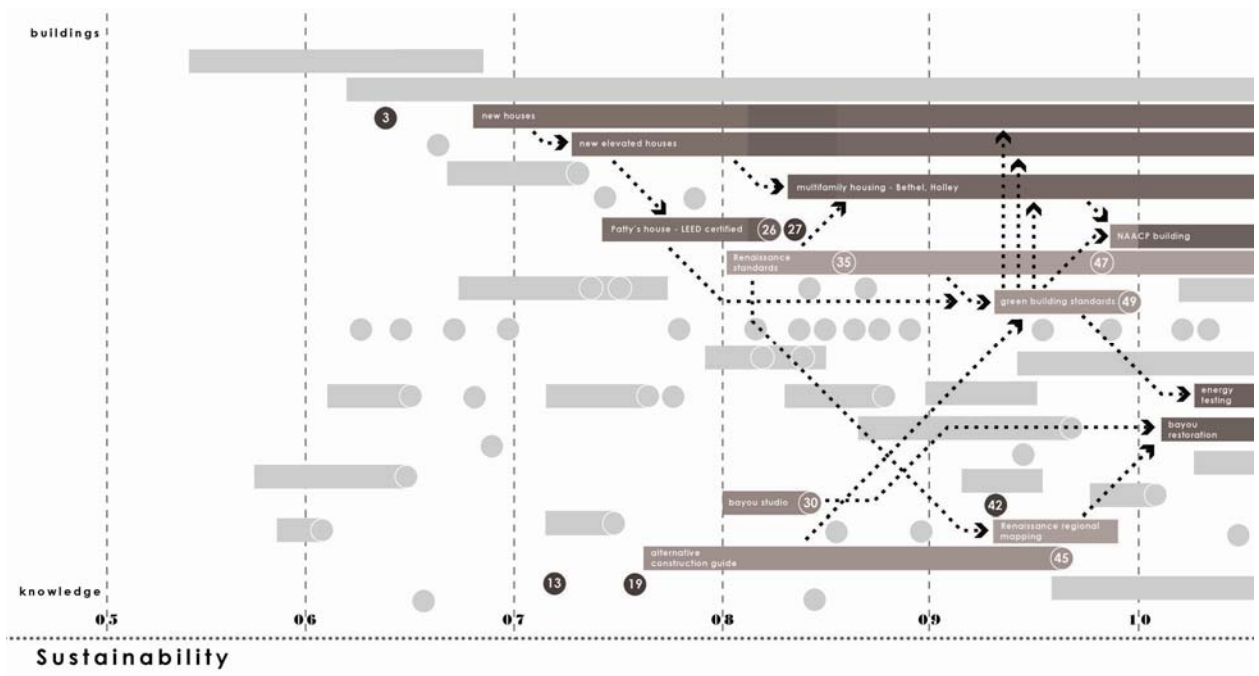
The work diagram illustrates the complexity of practical research and the pragmatic advantages of such complexity. Any design practice has multiple objectives, including such concerns as user well-being, energy conservation, environmental protection, economic security,

public appreciation, and formal expression. A practice has multiple lines that connect various activities. Some activities are focused on completing building projects, other activities are focused on creating new tools, knowledge, and techniques, and other activities are focused on communication. The diagrams on the following pages show some of the connecting activity lines of the GCCDS East Biloxi work, highlighting community engagement, sustainability, and risk mitigation.

### **Risk Mitigation Practical Research**

A line of activity that is particular to the East Biloxi work is staged by the question, "How does a community build in an environment that is now seen to have a higher risk?" This question is addressed by both technical and social means and is the sort of question that is relevant to the design challenges of our time in any city. The line of activity around environmental risk is a line shaped by precaution and uncertainty and is shown in the last diagram of the four that follow.





The line of risk mitigation activities began soon after Hurricane Katrina with a series of six community meetings, a resident survey, and GIS mapping of post-Katrina property conditions. The meetings and surveys were organized in partnership with the East Biloxi Coordination, Relief and Redevelopment Agency and Warnke Community Consultants. The primary output was the *East Biloxi Community Action Plan*, a document that compiled the concerns and priorities of the community for rebuilding after Hurricane Katrina.

The resident survey offers some insight into the community's reaction to an increased awareness of risk. When asked what people liked most about living in East Biloxi before Katrina, the top response was "sense of community." The closely ranked second response was "friends and family." These two responses were selected more than twice the other choices, such as "affordable housing," "schools," and "good place to raise children." Likewise, when asked to choose three things they most wanted to see rebuilt, restored or improved in East Biloxi, the greatest proportion of respondents chose "affordable housing" followed by "sense of community." Placing affordable housing as the top priority is expected with hundreds of families displaced and living in FEMA trailers. However, knowing that the respondents placed sense of community next, rating it above other choices such as employment opportunities, low crime rate, schools, and social services, echoes the reasons people gave for liking to live in East Biloxi. It is a clear indication that the residents value the social support of the community, especially in a time of crisis, and that they identify East Biloxi as a place known to have whatever people imagine when they use the phrase "sense of community."

The activities along the line of risk mitigation are not exclusively technical. Rebuilding a sense of community in an environment of uncertainty requires various activities that aim to provide useful knowledge to the community. Concurrent with the community meetings and surveys the GCCDS produced one of many such information outputs with what came to be known as the "grid map," a map dividing East Biloxi into 24 numbered blocks in order to communicate and coordinate the relief and clean-up efforts. Stacks of the color grid maps, reproduced on 11" x 17" paper, were used by dozens of organizations to plan and distribute relief and rebuilding activities. The pragmatic task of making a well-designed map had a magnified impact. The primary function was coordinating relief activities, but there were two further byproducts of the

grid map. First, the community looked at the map and was able to imagine an organized relief effort at a time when everyone felt overwhelmed and confused. Second, the grid map introduced the community and the many relief organizations to the architects and planners of the GCCDS. Many people in the community were already suspicious of outside planners because of the highly publicized Mississippi Renewal Forum Charrette. In spite of the charrette's support from the state's elected leaders and its positive publicity, many residents were upset that they had been left out of the planning process and were offended that a planning firm from California was showing them "what East Biloxi could look like." The fact that the GCCDS simply made clear and useful maps was an important part of gaining the community's trust.



*East Biloxi neighborhood grid map, distributed to assist volunteer relief activities*

The grid map is one of the many maps that the GCCDS created for use by the community. These various maps include flood maps made to clearly explain the otherwise confusing FEMA flood levels, maps showing the disproportionate impact of the hurricane damage on Biloxi's Vietnamese community, and maps showing the change of policy for casinos now allowed to be built within 800 feet of the coast line. The GCCDS initiated a comprehensive inventory of all the residential property in East Biloxi and created a detailed GIS database of the land use, building condition, and the rebuilding status of the approximate 5000 residential lots in East Biloxi. The East Biloxi GIS database has been updated twice with the help of volunteers, architecture students and GCCDS staff. The data has been used to produce maps describing property conditions, location of FEMA trailers, vacant lots, and rebuilding status. Many of the outputs shown on the work diagram include information created from the GCCDS

property inventory. As the East Biloxi work progressed the GIS property data served as the base for neighborhood planning activities. Future mapping efforts are planned to create in-depth information about the disposition of the over 2000 vacant residential lots in East Biloxi to help the community address issues of ownership, property value, and maintenance, and to consider the benefits of a land trust or land banking to help preserve local ownership and increase community stewardship.

House projects have been a major part of the GCCDS work. To date, the GCCDS has provided full architectural services for over 120 completed new houses, has assisted at a variety of levels in over a hundred rehabilitations of damaged houses, and has provided design assistance on dozens of multi-unit and single-family housing projects. The house projects are an ongoing part of the GCCDS practice. At any time each of the designers in the GCCDS has five or six house projects that are either in design or in construction. In most cases the house designs are particular for a client and site. The GCCDS has been a clear and consistent advocate for sustainable design and for including the home owner in the design process. Each partner organization has been influenced by this design emphasis and has become aware of the benefits of involving residents in design to produce well-built houses that are well-suited to the site and family, are well-loved by the home owners, and appreciated by their neighbors.



*East Biloxi resident Edward Parker with a GCCDS-designed home. Image © Alan Karchmer 2008*

An important lesson for practical research is shown in the diagrams indicating how activities are grouped into various grants. The house design activities have been ongoing and continuous even though they have been supported by different grants with different project periods. Some of the funding is tied into the program being used by a partner organization. For example, a large funding source for rebuilding in Mississippi is HUD Community Development Block Grant (CDBG) funding administered through the Mississippi Development Authority. The GCCDS has a HUD grant that supports design assistance to other recipients of the CDBG funds. Because the GCCDS is paid directly from HUD, the cost of the professional services is not a burden to the homeowner or to the partner non-profit organization. Other GCCDS funding is tied into housing issues. For example, the GCCDS received a grant from the Department of Energy to advance the energy performance of houses being built in East Biloxi. The grant supported research of different energy standards and the creation of design tools to make decisions about building materials and systems. Finally, the GCCDS has funding from a private foundation with a mission of supporting affordable housing and economic development. Such broadly defined funding is helpful to fill the gaps between more defined research grants.

A particular research issue that is part of the risk mitigation activity line is the design of houses that are required to be elevated due to increased flood requirements following Hurricane Katrina. The design of elevated houses has structural, social, economic, and experiential factors, which all require research to gain useful information for design. In addition, as with any design activity, ideas about building and landscape are implemented and inform the language used to engage the client in the design process. These inputs are examples of the type of research *for* practice. The knowledge produced is important to advancing a practice from one project to another.



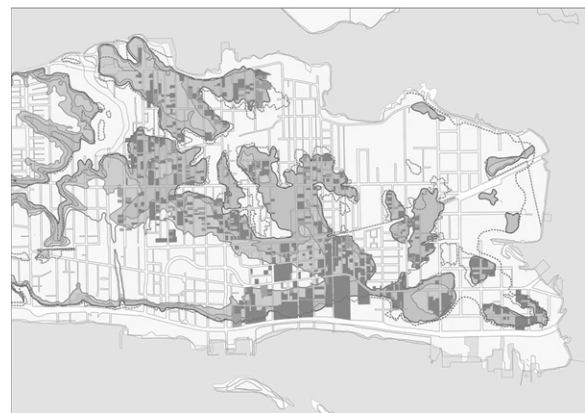
*A new GCCDS East Biloxi house elevated 13' above grade. Image © Alan Karchmer 2008*

The elevated house projects of the GCCDS also teach lessons that can be shared with others. These lessons are examples of research *from* practice and the outputs are as varied as the audience. The diagram shows some of these outputs. They include professional outputs such as AIA design awards, AIA conferences, professional publications such as *Architectural Record*, and open-house events for local architects. The outputs also include peer review conferences such as *Structures for Inclusion*, the *Association for Community Design*, and *Association of Collegiate Schools of Architecture*, as well as publications such as the *Journal of Architecture Education*. There are also many opportunities to share the lessons learned with the general public through local media, to non-profit organization in various conferences and meetings, and to dozens of people that have visited the GCCDS. These outputs are not part of a research grant; however, they are a necessary part of research. Without such outputs practical knowledge remains internal to the practice and does not constitute research.

A return overview of the risk mitigation line of activities shows that the line proceeds from survey, mapping, and house design to neighborhood planning. The primary supporter of the East Biloxi GCCDS planning work is the Knight Foundation, which provides funds through the Biloxi Housing Authority. The audience for the planning work is layered. After Katrina the Biloxi Housing Authority provided

leadership within Biloxi to bring together four other housing organizations to form an informal association that agreed to work together and not compete in purchasing property and seeking funding. The GCCDS was included to help coordinate neighborhood development plans and to be a planning resource for all of the organizations. In addition to the five housing organizations, the audience for the East Biloxi planning work is the residents and leadership of Biloxi.

The formal output of the East Biloxi neighborhood planning work was a final report and presentations to the Housing Authority, to other partners, and to the general community. In a practice, however, informal outputs are often more effective than formal ones. One such informal output has been an ongoing assistance to help the Housing Authority and other partners identify property to purchase. The GCCDS produced a map combining vacant lot information gained from the property survey with flood information from FEMA to show the vacant lots that require less than six feet of elevation for new houses. This map has been useful in a different way than the "grid map" described above and illustrates the evolution of the GCCDS work in the changing context of hurricane recovery. The grid map was needed at the time when hundreds of volunteers were cleaning out and repairing houses. The vacant lot map was needed when housing organizations began to receive funds to purchase property to build new houses.



*Map showing vacant East Biloxi properties on higher ground*

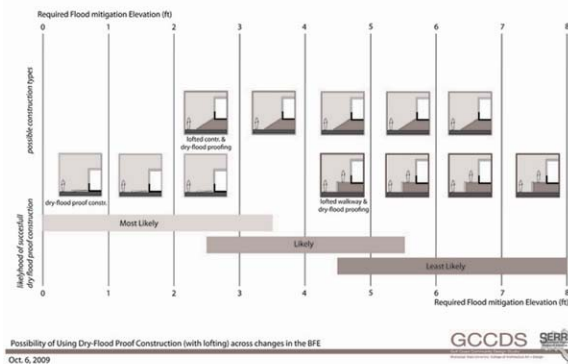
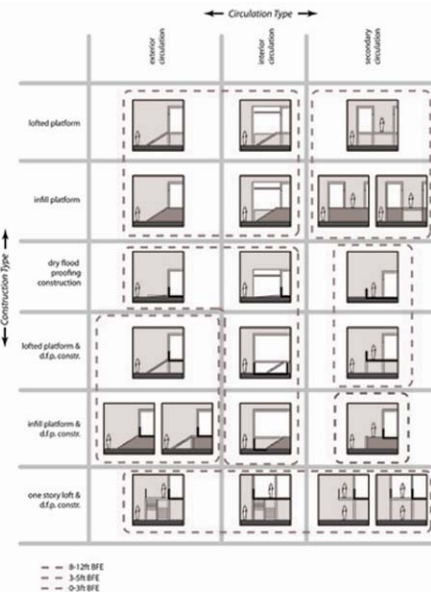
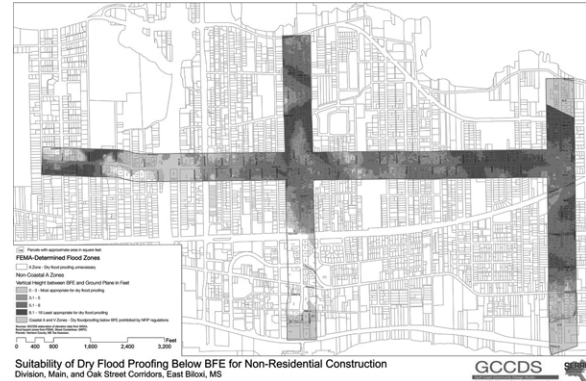
The East Biloxi planning work report is not a conventional "master plan" for the neighborhood with drawings of an imagined future with tree lined streets and picturesque shops. Instead, the report is a document with useful



information on existing conditions, available buildings and property, market needs and opportunities, prototype developments, suggested streetscape improvements, and detailed information on the flood mitigation factors that will shape future buildings. The information of flood mitigation is especially relevant along the line of activities addressing risk and is a part of the research that connects the planning work to other later and future projects.

East Biloxi has several historic commercial streets that are now in flood zones following Hurricane Katrina. The base flood elevation (BFE) requirement - the required height of occupied floors above sea level - varies with topography and requires different building responses. Housing is always required to be above the BFE, but there is an allowance for commercial space in some cases to be located below the BFE if the construction meets the requirements for flood-proof construction. However, flood-proof construction is unfamiliar to developers, architects, flood-plain managers, insurance companies, building inspectors, and to the general public. While developing the neighborhood planning work the GCCDS realized the lack of community knowledge regarding flood-proof construction. When a funding program was advertised to the university from the Department of Homeland Security's South-East Region Research Initiative (SERRI) the GCCDS already knew that flood-proof construction was an area of research needed by the community. The GCCDS successfully proposed a SERRI research project to combine planning and architectural research to investigate the flood-proof construction and to create useful educational tools to help Gulf Coast communities better understand the cost, performance criteria, and regulatory and insurance factors of new commercial buildings in flood zones.

The planning component of the SERRI project is illustrative of the continuing evolution of the GCCDS work. The map shown below analyzes the primary commercial streets of East Biloxi and shows how changes of only a few feet in the BFE lead to different flood mitigation responses. The map shown requires a higher degree of GIS expertise to create than the grid map or the vacant property map; the information produced is likewise more technical and advanced. The accompanying building diagrams show different types of flood mitigation strategies.



Flood-proofing schematic building design diagrams

The GCCDS is in the first of two years of funding from the Department of Homeland Security. The SERRI research will include full-scale testing of wall assemblies for strength, water penetration and moisture retention. The output will be aimed at a broad audience and will strive to help the community understand the factors of flood-proof construction. However, along with the general audience there are two other applications for the research. The Biloxi Housing Authority has purchased several parcels along Division Street and Main Street and plans to develop some mixed-use projects. The GCCDS will work with the Housing Authority to explore the feasibility of using flood-proof construction. The other target application is less defined, but comes from the realization that having information on hand will almost certainly lead to opportunities. There is an aspect of hope in the research that the information on flood-proof construction will help a developer choose to build in the low-income community of East Biloxi, bringing much needed jobs and business. As with other GCCDS work the flood-proof construction research will find outputs beyond those promised in the grant agreement. The grant budget includes funds to present the work at several national conferences.

## Conclusion

An open ended practice such as GCCDS is well suited to work in a context of uncertainty because the complex problems of any community have many factors and require long-term work. Even though there are some factors that have available solutions that can be applied to community problems, there are other factors that are inherently uncertain, especially factors associated with environmental risks and health effects of industrialization. Much of the work of this century is destined to address the side effects of modernization, hazards that were once not known, and to proceed with the realization that we will continue to produce side effects with risks that are currently not known. The simple diametric model of knowledge versus lack of knowledge has been replaced by gradual degrees of non-knowing. Uncertainty can no longer be seen as defining those things that will be known once we have better methods of inquiry; it is a primary ingredient of contemporary problems. The threatening risks from the once unknown effects of industrialization are accumulating at a pace that does not give us time to wait for science to clear up confusion and disagreement. Making decisions in the twenty-first century requires the ability to function within different types of non-knowing in order to manage the

effects of what we know and to proceed with caution, knowing how to mitigate the risks of what we don't know.<sup>1</sup>

Uncertainty of this sort should not be confused with probability. The interventionist economist John Maynard Keynes defines the uncertainty of complex problems. As early as 1936 he taught:

By "uncertain" knowledge . . . I do not mean merely to distinguish what is known for certain from what is merely probable. The game of roulette is not subject, in this sense, to uncertainty . . . The sense in which I am using the term is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence . . . About these matters there is not scientific basis on which to form any calculable probability whatever.<sup>2</sup>

Practical research, such as the work of the GCCDS, addresses complex community problems with a degree of uncertainty. The research is shaped by the needs of the community because the problems are tied into actual projects. Grants support the work of producing both buildings and knowledge. The grants also create sponsorships that shape the work. Such subsidization should not be seen as a negative complication. A subsidized design practice mitigates the self-interests of private ownership by replacing the simple two-point model of the architect working for a client with a three point model of the architect, the user, and a separate funding source. Community design has traditionally aimed at bringing design services to segments of the population that are not able to pay. In the past, bringing design assistance to low-income communities was enough of a cause to justify the effort. However, in the working space of uncertainty bringing design services to under-served communities is only part of the work, because the impact *on* low-income residents as well as the impact *of* any project beyond its own boundaries should be taken into account. Even in community design, merely pleasing a client is a low standard of success. In other words, there is more at stake than to merely replace a paying client with a non-paying client. The problems of our time require practices that get beyond the limited interests of *any* single client. A practice such as the Gulf Coast Community Design Studio, which combines community projects with research, has the

opportunity to address today's complex problems and produce useful knowledge that helps others do the same.



*East Biloxi residents Nghia and Ban Tran with their GCCDS-designed house under construction. Image © Alan Karchmer 2008*

---

**NOTES:**

<sup>1</sup> Theories of knowledge and non-knowledge are part of Ulrich Beck's description of "Reflexive Modernization," in his influential 1992 book *Risk Society: Towards a New Modernity*, and his later writings, especially *Reflexive Modernization*, 1994, and *World at Risk*, 2009. Beck compares linear theories of knowledge in which non-knowing is not relevant, to non-linear theories in which the "types, constructions, and effects of non-knowing constitute a key problem in the transition to the second, reflexive modernity." See Ulrich Beck, *World at Risk*, Polity Press, Cambridge, 2009, page 125.

<sup>2</sup> John Maynard Keynes, "The General Theory of Employment," *Quarterly Journal of Economics*, 1936, page 213-214.