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Risk, Vulnerability, and Hazards: The Industrial Canal and the Lower Ninth Ward

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Risk, Vulnerability, and Hazards:
The Industrial Canal and the Lower Ninth Ward

A Dissertation

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

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in
Urban Studies
Urban Affairs

by

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Abstract

The purpose of this study is to identify, analyze, and describe the social outcomes that may be affected by the environmental risks generated by infrastructure projects; to examine the ways in which vulnerability and exposure to hazards may increase risk in neighborhoods over time; and to examine the implications of addressing the exacerbation of exposure to natural hazards within the traditional environmental justice framework. The Industrial Canal and Lower Ninth Ward were selected as the subjects of this case study because the canal has existed on the perimeter of the neighborhood for nearly one century, isolating Lower Ninth Ward residents from the rest of New Orleans and significantly contributing to two catastrophic flood events.

The findings of the study are as follows: (1) the environmental risks associated with infrastructure projects can be magnified when imposed on an already vulnerable neighborhood, and may ultimately result in hazard events which cause displacement and disinvestment. Such consequences can have an impact on micro-level (individual and household) and macro-level (neighborhood) social outcomes; (2) vulnerability and exposure to hazards can initiate a pattern of increased risk that intensifies vulnerability to subsequent hazard events; and, finally, (3) the parallels between the causes and consequences of traditional environmental justice issues and the exacerbation of exposure to natural hazards implies that framing issues relative to natural hazards as matters of justice and articulating the social consequences of not mitigating such hazards can be an excellent way of educating stakeholders and lobbying for resources.

Keywords: risk; hazards; vulnerability; environmental justice; Industrial Canal; Lower Ninth Ward

1 Introduction

The *Inner-Harbor Navigation Canal* (Industrial Canal) was constructed in New Orleans in 1923 for the purpose of connecting Lake Pontchartrain to the Mississippi River and furthering shipping and shipbuilding interests in one of the most prominent port cities in the history of the United States. Located in the eastern part of the city, the Industrial Canal bisected the Ninth Ward area and created a distinct neighborhood on its eastern banks that would come to be known as the Lower Ninth Ward. The Lower Ninth Ward was largely undeveloped at the time the Industrial Canal was constructed, but the neighborhood experienced tremendous growth between 1910 and 1960 as the canal became a major industrial corridor (Campanella 2009).

Despite the growth of the Lower Ninth Ward, the neighborhood's isolated geographic disposition (severed from the rest of New Orleans by the Industrial Canal and bound on the north and south by Bayou Bienvenue and the Mississippi River, respectively) and vulnerable population contributed to the Lower Ninth Ward being subjected to municipal neglect throughout its existence. Additionally, the Industrial Canal would function as a floodway in the Lower Ninth Ward, contributing to catastrophic flooding during hurricanes Betsy (1965) and Katrina (2005). After the population of the Lower Ninth Ward swelled from 5,500 in 1910 to 33,000 in 1960, it declined to below 3,000 as of 2010 (Campanella 2009; American Community Survey 2006-2010). There were over 1,700 vacant housing units in the Lower Ninth Ward as of 2010, not including the thousands of units demolished since Hurricane Katrina (Greater New Orleans Community Data Center 2011).

Over the past century, media and other accounts of the Lower Ninth Ward have generally been negative, particularly following Hurricane Katrina. While the neighborhood has certainly faced a number of challenges throughout its existence and can be described as distressed, Lower

Ninth Ward residents have touted the neighborhood's independent spirit and solidarity. Such qualities may also ironically be a consequence of the Lower Ninth Ward's isolated disposition east of the Industrial Canal. Residents interviewed by Giancarlo (2011) indicated that their families originally settled in the Lower Ninth Ward in order to become homeowners and to "live the American dream" (122). Historically high rates of homeownership in the neighborhood (roughly ranging from 54%-66% between 1974 and 2010) and other suburban characteristics and values have also been a great source of pride for the working-class Lower Ninth Ward (Lower Ninth Ward 1974; US Census 2010; Giancarlo 2011; Greater New Orleans Community Data Center 2012).

Early Lower Ninth Ward settlers recall a rural atmosphere that offered affordable housing opportunities and strong community bonds among its residents (Landphair 1999; 2007; Giancarlo 2011). As an isolated downriver neighborhood, the Lower Ninth Ward had historically been underserved by the City of New Orleans and other public agencies. However, the neighborhood established a strong sense of independence and a tradition of civic activism from its earliest days. Such strengths would later prove useful during the civil rights movement and beyond.

After experiencing tremendous growth through the 1960's, the population of the Lower Ninth Ward began to decline. Additionally, the Lower Ninth Ward had to be rebuilt after Hurricane Betsy flooded 80% of the neighborhood in 1965. The challenges associated with Hurricane Betsy were not enough to deter Lower Ninth Ward residents from continuing to advocate on behalf of their neighborhood—plans to expand the Industrial Canal locks were thwarted by area residents in the early 1970's and have been stalled ever since. Before Hurricane Katrina struck (2005), the Lower Ninth Ward had maintained its close-knit identity.

The Lower Ninth Ward can currently be described as a neighborhood where the convergence of the past and the future colors the landscape. The Industrial Canal and accessory structures such as drawbridges, levee and floodwall remain unchanged by Hurricane Katrina, although the height and design of the floodwall have been upgraded. The main thoroughfares (St. Claude Avenue and Claiborne Avenue) are dotted by a combination of older storefronts and traditional New Orleans shotgun homes and bungalows (many of which are now abandoned), and modern buildings such as Martin Luther King Elementary School and Brad Pitt's futuristically designed *Make it Right Foundation* homes. Ongoing streetscape improvement projects on both of the main thoroughfares include the planting of new palm trees near century-old oaks and the use of modern art as a means of memorializing the victims of Hurricane Katrina. A new historical marker now identifies McDonough No. 19 School on St. Claude Avenue for its role in public school integration in New Orleans during the 1960's, although the school itself remains shuttered and abandoned. Huge swaths of vacant lots on the northern side of the Lower Ninth Ward provide visitors with an idea of what the neighborhood might have looked like seventy years ago, as areas where there were once homes, schools, and playgrounds now more closely resembles a prairie.

1.1 Risk, Vulnerability, and Hazards

Risk may generally be defined as “a combination of the likelihood of an occurrence of a hazardous event or exposure(s) and the severity of injury or ill health that can be caused by the event or exposure(s)” (Occupational Health and Safety Advisory Services 2007). Additionally, Cutter (2006) describes the two components of risk as “potential sources of risk (industrial, flooding, transportation) and the contextual nature of the risk itself (high consequence, low consequence)” (79). From a theoretical standpoint, risk may also be viewed as the chances and

dangers associated with the successes of modernity (Giddens 1990; Beck 1992; 2009). Discussions regarding risk are often accompanied by references to vulnerability and hazards. While these three concepts are in fact different, the interaction between each of them is instructive in terms of understanding their individual functions. The interaction between risk, vulnerability, and hazards can be summarized as follows:

Risk is a combination of the factors that determine the potential for people to be exposed to particular types of natural hazard. But it also depends fundamentally on how social systems and their associated power relations impact certain social groups... In other words, to understand disasters we must not only know about the types of hazards that might affect people, but also the different levels of vulnerability of different groups of people. (Wisner, et al 1994, 7)

In the case of the Lower Ninth Ward neighborhood, the Industrial Canal has been a source of risk for nearly one century. Not only has the Industrial Canal spatially isolated the Lower Ninth Ward from the rest of New Orleans, thereby limiting the availability of municipal services for neighborhood residents, but the canal has also functioned as a floodway that contributed to catastrophic flooding in the Lower Ninth Ward during hurricanes Betsy and Katrina. The loss of life and property in the Lower Ninth Ward due to the flooding associated with the failure of levees and floodwalls along the Industrial Canal qualifies the human-made water navigation canal as a risk and suggests that the interaction between risk and vulnerability in the neighborhood may be instructive in terms of how and why hazards have impacted Lower Ninth Ward residents.

According to Pelling (2003), *vulnerability* “denotes exposure to risk and an inability to avoid or absorb potential harm” (5). Just as the Industrial Canal may be considered a risk to the Lower Ninth Ward, it may also be said that neighborhood residents are *vulnerable* to the adverse impacts associated with the presence of the Industrial Canal—not simply because of the spatial disposition of the canal itself (*physical vulnerability*), but because of the social makeup of the working-class, African-American neighborhood (*social vulnerability*). While physical vulnerability best describes the Lower Ninth Ward’s location in coastal Louisiana and near the Industrial Canal, social vulnerability describes the socioeconomic and political attributes of the neighborhood residents themselves. Cutter, et al (2003) and Pelling (2003) found that social vulnerability actually has a greater bearing on a community’s ability to cope with hazards than physical vulnerability.

Pelling (2003) defines *hazards* as that which has “the potential to harm individuals or human systems” (5). When analyzed in tandem with risk and vulnerability, hazards may be viewed as the outcome of risk, and the degree to which a hazard is experienced is likely to depend on the level of vulnerability attributed to those who are affected by the hazard. In terms of the Lower Ninth Ward, hurricanes Betsy and Katrina may be considered hazard events that resulted from the risk imposed on neighborhood residents by the presence of the Industrial Canal (among other factors), and the vulnerability of the residents themselves.

Technological hazards can be defined as the “products of industrialization that pose a health or safety threat to humans” (Mileti 1999, 188). While this designation is typically reserved for hazards such as hazardous waste and chemicals, structural mitigation measures such as levees and dams may also be viewed as technological hazards in that they tend to induce development and have the potential to fail and cause the loss of life and property. According to Pelling (2003),

the presence of environmental infrastructure such as levees can: (1) increase development on hazardous sites; and (2) increase the value of “protected” land (49). In the case of the Industrial Canal, the canal itself may be viewed as a technological hazard in that it is human-made and functions as a floodway in a residential area. The levee and floodwall lining the Industrial Canal may also be viewed as technological hazards in that their existence has fostered development in the Lower Ninth Ward and their failures have resulted in catastrophic flooding on two occasions.

Since the Industrial Canal and its components are generally harmless (in terms of floods) absent the *natural* occurrence of a hurricane and accompanying storm surge, they may not be viewed as *purely* technological hazards. The Lower Ninth Ward (located in an already vulnerable coastal region) would be exposed to natural hazards such as hurricanes whether the Industrial Canal existed or not. The Industrial Canal simply exacerbates the exposure (albeit significantly) due to its location and impact on development in the area. Other hazards relative to the Industrial Canal, such as navigational hazards (marine vessels colliding with bridges and the levee/floodwall) and industrial accidents (such as fires in and around the canal) may be viewed as purely technological unless they have occurred as a secondary event to a natural hazard (such as a barge crash that is induced by a hurricane). As Cutter (2006) points out, “the distinction between natural and technological hazards is now blurred, with hazards being viewed as a continuum of interactions among physical, social, and technological systems” (85).

Natech disasters have been described as events in which the debilitating consequences of both natural and technological hazards converge (Steinberg and Cruz 2004; Picou and Marshall 2006). Natech disasters are frequently cited by scholars as natural events that trigger the release of chemicals and other technological hazards into the environment and cause biological harm that often results in litigation against a responsible party (Picou 2009; Brunsmas and Picou eds.

2008; Picou and Marshall 2006; 2007). Although the Industrial Canal may be viewed as a technological hazard because of its role in exacerbating flooding in the Lower Ninth Ward during hurricanes Betsy and Katrina, the release of toxic chemicals and other hazards that may have occurred as a result of such events are beyond the scope of this study. However, it is worth noting that the “contested discourse and social conflict” and litigation resulting from both hurricanes provide a basis for considering the events natech disasters and addressing the Industrial Canal as a core technological component (Picou 2009, 41).

The above analysis of risk, vulnerability, and hazards has been simplified in order to illustrate the basic relationship between each of the three phenomena and to demonstrate how they relate to the Industrial Canal and Lower Ninth Ward subjects. However, the Industrial Canal and the Lower Ninth Ward have existed adjacent to one another for nearly one century, and the interaction between risk, vulnerability, and hazards in the neighborhood is more nuanced and complex than the brief analysis above suggests. The risks associated with the construction of the Industrial Canal represent the cost of furthering commercial interests in New Orleans, a port city from its inception. The vulnerability of Lower Ninth Ward residents is not only a *consequence* of the Industrial Canal’s function as a physical barrier and floodway, but is likely the *cause* of the area initially being selected as the site of the canal.

1.2 Environmental Justice

Environmental justice first became a salient issue in the United States in 1982 when 500 African-American demonstrators were arrested in Afton, North Carolina during a protest over the proposed disposal of toxic waste in a local landfill (Sandler and Pezzullo 2007, 1080). The movement began as a crusade by African-Americans in the South against environmental racism and was later expanded to address the poor and other minorities’ struggles against the unequal

distribution of environmental hazards throughout the United States (Bullard 1990; 1994; Roberts and Toffolon-Weiss 2001; Cole and Foster 2001; Sandler and Pezzullo 2007).

Although the African-American community was reluctant to engage in the environmental movement (different from the environmental *justice* movement because it was not as concerned with the social dimensions of environmental hazards) in the 1960's because issues relative to civil rights were a higher priority. Bryant and Mohai (1992) would later find that "people of color are beginning to realize that issues of environmental degradation, economics, power, politics, and racism are intricately interwoven and cannot be separated" (6). The environmental justice movement has since provided African-Americans and others with a vehicle for "integrating environmental issues into traditional civil rights agendas..." (Bryant and Mohai 1992, 95). Despite the growth of the environmental justice movement over the past several decades, it has typically been limited to addressing issues such as pollution and hazardous waste.

In terms of the Industrial Canal and Lower Ninth Ward, the technological (human-caused and induced by industry and/or the state) hazards posed by the canal and its components is similar to that of the technological hazards that are typically addressed within the environmental justice framework, such as pollution and hazardous waste (Cole and Foster 2001; Sandler and Pezzullo 2007). Additionally, given the connection between the civil rights movement and the environmental justice movement in the African-American community at large and the historical culture of activism in the Lower Ninth Ward, the potential exists for the exacerbation of natural hazards such as floods to also be addressed within the traditional environmental justice framework. The parallels between these processes make this expanded view of environmental justice an interesting prospect worthy of further inquiry.

1.3 Purpose and Findings

The interplay between the risks generated by the Industrial Canal, the vulnerability of the Lower Ninth Ward, and the hazards experienced in the neighborhood due to the presence of the canal, makes the Industrial Canal and Lower Ninth Ward appropriate subjects for studying the environmental and social impacts associated with infrastructure projects. Additionally, there are many parallels between the ways in which industry and the state have imposed the risks associated with the Industrial Canal and the ways in which other types of risks, such as pollution and hazardous waste, have been imposed by industry and the state in other instances. The Industrial Canal and Lower Ninth Ward therefore also make appropriate subjects for the study of approaching the exacerbation of exposure to natural hazards as an environmental justice issue.

While the existing body of literature on the topics of risk, vulnerability, and hazards is extensive, the ways in which infrastructure projects can influence the interplay between these three phenomena and affect environmental and social outcomes are worthy of further inquiry. The existing body of scholarly literature on the topic of environmental justice is also extensive. However, literature pertaining to the exacerbation of exposure to natural hazards as an environmental justice issue is limited since “socially created vulnerabilities are largely ignored in the hazards and disaster literature because they are so hard to measure and quantify” (Cutter 2006, xxii). The purpose of this study is to contribute to the aforementioned literature by identifying, analyzing, and describing the social outcomes that may be affected by the environmental risks generated by infrastructure projects; examining the ways in which vulnerability and exposure to hazards may increase risks to neighborhoods over time; and examining the implications of addressing the exacerbation of exposure to natural hazards within the traditional environmental justice framework.

This study specifically addresses the following research questions: (1) how has the presence of the Industrial Canal generated environmental risks and affected social outcomes in the Lower Ninth Ward; (2) how have vulnerability and exposure to hazards increased risk in the Lower Ninth Ward over time; and (3) what are the implications of addressing the exacerbation of exposure to natural hazards within the traditional environmental justice framework? Given the scope and complexity of the interaction between the Industrial Canal and Lower Ninth Ward over the past century, a case study research design was employed for the purpose of answering the proposed research questions. Data for the study—including newspaper articles, government reports and correspondence, photographs, maps, and other images—were collected from a time period inclusive of 1900-2012 and were drawn from a wide range of sources.

Data were organized chronologically, analyzed in light of the proposed research questions and existing literature, and were coded according to a number of *a priori* and emerging constructs. The data were then condensed into three major themes, including *isolation and distance, exposure to hazards, and race and class*. A final analysis of the data was then conducted and the findings of the study were documented in the body of this paper.

The findings of the study are as follows: (1) the environmental risks associated with infrastructure projects can be magnified when imposed on an already vulnerable neighborhood, and may ultimately result in hazard events which cause displacement and disinvestment. Such consequences can have a profound impact on micro-level (individual and household) and macro-level (neighborhood) social outcomes. In the case of the Lower Ninth Ward, the neighborhood was already socially vulnerable when the risks associated with the Industrial Canal were introduced to the area. Development in the working-class Lower Ninth Ward intensified through 1960, exposing an even larger vulnerable population to the risks associated with the Industrial

Canal. The isolating effect of the Industrial Canal contributed to lapses in the provision of public services in the Lower Ninth Ward, further increasing the vulnerability of the neighborhood.

Events such as hurricanes Betsy and Katrina exposed Lower Ninth Ward lack of political and economic assets and resulted in neighborhood displacement and disinvestment. Hurricane Katrina marked the culmination of Lower Ninth Ward displacement and disinvestment—devastating population loss disrupted the social fabric of the neighborhood, and generations of residents’ struggles for neighborhood amenities such as drainage and schools were diminished.

Secondly, (2) vulnerability and exposure to hazards can initiate an increase in risk that intensifies vulnerability to subsequent hazard events. Exposure to the risks associated with the Industrial Canal and the experience of hazard events such as hurricanes Betsy and Katrina had the effect of diminishing Lower Ninth Ward political and economic assets and making the neighborhood more vulnerable over time. Although the hurricane protection system around the Industrial Canal and Lower Ninth Ward has recently been upgraded, such “modern” elements have a history of failure and could possibly reinitiate the vulnerability-hazards pattern of risk in the neighborhood.

Finally, (3) the parallels between the causes and consequences of traditional environmental justice issues and the exacerbation of exposure to natural hazards implies that framing issues relative to natural hazards as matters of justice and articulating the social consequences of not mitigating such hazards can be an excellent way of educating stakeholders and lobbying for resources. The Industrial Canal was constructed as a venture by industry and the state for the purpose of furthering commercial interests. Given the technological character of the hazards associated with the Industrial Canal and the catastrophic natech disasters that the canal has contributed to, there are many parallels between the Industrial Canal’s impact on the

Lower Ninth Ward and the modern institutions and structural inequities that cause other communities to be impacted by traditional environmental hazards (such as pollution and hazardous waste). Since traditional environmental hazards have been actively addressed within the environmental justice framework, the possibility of addressing technological hazards (such as the Industrial Canal) that exacerbate exposure to natural hazards (such as floods), within the environmental justice framework also exists. Neighborhoods such as the predominantly working-class, African-American Lower Ninth Ward may already have an established tradition of civic activism and the capacity to address increased exposure to natural hazards in this manner.

1.4 Organization

Chapter 2 (Theoretical Perspectives) provides an outline of the relevant theories pertaining to the subject matter of the study. The chapter will explore the tensions between late modern theories which view risk as being global in nature (Beck 1992; 2009; Giddens 1990) and competing theories which acknowledge race, class, and gender as the primary determinants of exposure to risk and environmental hazards (Alario 1993; Alario and Freudenberg 2010). Additionally, this chapter will address a number of theories regarding vulnerability and its relationship to risk and hazards (Sen 1981; Chambers 1989; Swift 1989; Blaikie, et al 1994; Pelling 2003). Chapter 3 (Literature Review) consists of a review of relevant empirical studies, and is divided into four parts: (1) infrastructure projects and risk; (2) race and the environment; (3) vulnerability and hazards; and (4) isolation and vulnerability.

Chapter 4 (Context) provides an abbreviated history of navigable waterways in New Orleans and a description of the circumstances surrounding the construction of the Industrial Canal. Chapter 5 (Methods) explains the research design employed for the purpose of answering

the proposed research questions and outlines the constructs that were used to code data and to develop themes.

Chapter 6 (Isolation and Vulnerability) includes study findings and analysis concerning the environmental and social consequences of the Industrial Canal's function as a physical barrier in the Lower Ninth Ward. Chapter 7 (Hazards and Risk) includes study findings and analysis concerning risk and exposure to hazards in the Lower Ninth Ward. Chapter 8 (Elite Influence, Racialization, and Environmental Justice) includes study findings and analysis concerning environmental justice and the racialization of the Lower Ninth Ward. Finally, Chapter 9 (Conclusion) provides an overview of all study findings, addresses the proposed research questions, and provides suggestions for further research.

2 Theoretical Perspectives

Ulrich Beck, Anthony Giddens and Scott Lash have all extensively theorized about risk in contemporary society. Each of these theorists discuss risk in terms of modernity and have different views on how risks will impact society during what they consider to be a period of *reflexive modernity* (Beck, et al 1994); *late modernity* (Giddens 1990) or *hyper (second) modernity* (Beck 2009). Even though these theorists all collaborated to develop the concept of reflexive modernity, there are significant differences in the way these theorists view risk going forward.

Beck's theories of *Risk Society* (1992) and *World Risk Society* (2009) are the most well developed contemporary theories regarding risk. However, other scholars often challenge these theories, as will be demonstrated in the discussion of Alario's (1993) critique of Beck's risk society and the development of Alario and Freudenburg's (2008) competing theory of *Titanic Risks*. Other empirical studies such as those conducted by Olafsson and Ohman (2007) also seek to challenge Beck's views on risk. Beck also addresses vulnerability as being a consequence of decision-making that takes place within the context of modernity and the generation of global risks. Scholars such as Sen (1981); Chambers (1989); and Blaikie, et al (1994) have constructed theoretical approaches to vulnerability at more of a micro-level (individual, household, and community).

2.1 Risk

The modern era is an epoch that encompasses the industrialization of the western world (and beyond), mass production, the rise of the modern nation-state, capitalism and the globalization of the economy. The worldview associated with this epoch is that through rationality and objectivity, humankind can utilize scientific innovation and technology to become

“masters of the universe.” The modern era ushered in many technological advances and resulted in unprecedented progress. However, the modern era and many of the resulting technological advances also introduced the world to many new dangers, such as the invention of the atom bomb and the perpetual threat of nuclear warfare. For this reason, the consequences of the dangers generated during the modern era and the means by which society will cope with them going forward are critical to contemporary theories regarding risk.

Beck, Giddens and Lash all agree that society has entered a new epoch that is not purely modern but is also not post-modern. Rather, they state that the current epoch is merely the *next phase* of modernity. This new epoch has been referred to as reflexive, late or hyper (second) modernity. According to Giddens and Lash, reflexive modernization is “associated primarily (in keeping with its literal meaning) with knowledge (reflection) concerning the foundations, consequences, and problems of modernization” (Beck 2009, 119). Reflexive modernity cannot be understood in opposition to other epochs, although it does oppose the original form of modernity. According to Beck, the concept could more appropriately be interpreted as “the result of the side effects of modernization” (Beck 2009, 119).

The primary point of departure between Giddens and Lash’s version of reflexive modernity and Beck’s version is that Giddens and Lash state that the process of reflexive modernization will employ further use of science and technology to solve problems and mitigate the risks generated during the original modern era (Giddens 1990). Essentially, they argue that further advances in science and technology will serve to counteract the adverse effects and dangers introduced by modernity. Conversely, Beck subscribes to the theory of hyper (or second) modernity, which holds that science, innovation and the institutions of the modern era *are*

incapable of addressing the risks that have been generated by modernity. This assertion is based on the notion that:

The radicalization of modernity gives rise to this irony of risk: the sciences, the state and the military are becoming part of the problem they are supposed to solve. This is the meaning of ‘*reflexive modernization*’: we are not living in a *post-modern* world but in a *hyper-modern* world. (Beck 2009, 55)

Beck’s concept of risk society hinges on the idea that many of the productive forces of the modern era are now broken. “Risk society means precisely a constellation in which the idea of the controllability of decision-based side effects and dangers which is guiding for modernity has become questionable” (Beck 2009, 15). Beck first began developing his theory of risk society in his earliest major work, *Risk Society* (1992). It is here where he first establishes his post-Marxist position on the prominence of risk as a social issue:

With the expansion of the modernizing risk, the endangering of nature, health, food, and so forth, the social differences and its boundaries become relative. Within their range, objectively displayed risks have an equalizing effect for the victims. In this sense, risk society is no longer a class society. Its endangering condition is not comprehended in terms of class situation, nor its conflicts in terms of class conflicts. (Beck 1992, 25 and 26)

Following the September 11, 2001 terrorist attacks and other global events, Beck (2009) expanded his original theory of risk society to include *world risk society*. Beck’s most recent theory holds that decisions made by private interests and the state for the purpose of

industrialization and global economic development during the modern period have contributed to the proliferation of large scale global risks (such as global warming, global terrorism and nuclear warfare), and that now the associated hazards “become a political issue not because of their scale but because of a social feature: they do not assail us like a fate; rather we create them ourselves, they are a product of human hands and minds...” (Beck 2009, 25)

Because of the global nature of the emerging world risk society and society’s continual inability to cope with risk through conventional means (such as the modern nation-state, science, or private insurance), Beck argues that the social movement of *subpoliticization* is occurring. “Subpolitics refers to the *decoupling of politics from government*; it underlines that politics is possible beyond the representative institutions of the nation-states...subpolitics means the shaping and transformation of society from below...” (Beck 2009, 95) According to Beck, subpolitical movements are transcending not only the modern nation-state, but also traditional social cleavages such as race and class, as the means by which people *organize and seek action* in response to new risks. The resulting *risk communities* are diverse and cosmopolitan in nature, “based neither on descent nor on spatial presence” (Beck 2009, 188).

Beck argues that a primary feature of world risk society is *delocalization*: “causes and consequences are not limited to one geographic location or space; they are in principle omnipresent” (Beck 2009, 52). Even when risk appears to be experienced locally, Beck claims that it can be traced back to a larger context in which decision-makers create risk through their actions as participants in industrialization and globalization. Beck describes delocalization on three levels:

Spatial: the new risks (e.g climate change) are spreading over national borders, and even continents;

Temporal: the new risks have a long latency period (e.g nuclear waste), so that their future effects cannot be reliably determined and restricted; and

Social: since the new risks are the result of complex processes involving long chains of effects, their causes and effects cannot be determined with sufficient precision (e.g financial crises). (Beck 2009, 52)

Other scholars challenged whether Beck's version of a risk-laden, class-free and delocalized world risk society has actually formed. For the purpose of this study, two theoretical challenges and one empirical challenge will be discussed.

Alario (1993) credits Beck with amply demonstrating that "environmental risks have introduced an element of uncertainty that is absent from early modern theories that operate on the premise that history moves toward some kind of resolution of all social problems" (Alario 1993, 275 and 276). However, Alario disputes whether Beck's new political paradigm has completely replaced existing paradigms such as race and class. He criticizes Beck for overlooking ongoing ethnic conflicts and patterns of disproportionate effects of environmental risk on minorities and the poor:

The risk society thesis confuses the breakthrough of a new field of political contention with the complete substitution of the existing social and international order. For the political actors who subscribe to the risk society thesis, this miscalculation has been politically costly inasmuch as it has yielded only modest alliances with the socioeconomic and ethnic groups most immediately

affected by the environmental degradation in both urban and rural settings, and even then, disproportionate to their actual risk.

(Alario 1993, 282 and 283)

Alario's critique of Beck's theory has been supported by empirical studies. Swedish researchers Olofsson and Ohman (2007) conducted a study to test Beck's theory of world risk society by determining whether sub-political movements regarding large-scale risks had actually been occurring in Sweden. To that end, the researchers interviewed a wide cross-section of citizens from both urban and rural Sweden in order to see if they viewed such risks in the same way.

The findings of the study indicate that interviewees' views regarding risk varied geographically and across other lines such as class. Interviewees from rural parts of the country were more focused on localized risks, while those from the more urbanized areas tended to focus more on global risks. Additionally, because of class differences between rural and urban interviewees, they generally approached handling risk in different ways. For example, the more mobile, urban interviewees suggested things such as simply moving to another part of the world as a means of avoiding certain polluted areas. Rural respondents were more inclined to suggest changing certain personal behaviors as a means of mitigating risk (an example given is the avoidance of eating rhubarb or reindeer meat that came from contaminated areas after the Chernobyl accident). Olofsson and Ohman draw the following conclusions regarding their findings:

In this study we have operationalised Beck's theory of risk society in terms of people's perceptions and strategies, and the results show that our data does not support his thesis of a general

development among the public towards a reflexive view of new risks; on the contrary, the different groups seem to manage new risks quite differently... This empirical study of Beck's thesis can therefore not support his argument of the development into a risk society, at least not when it comes to people's perceptions and strategies among the investigated groups in Sweden. (Olofsson and Ohman 2007, 193 and 194)

Alario and Freudenberg (2010) subsequently proposed a competing hypothesis to Beck's theory of world risk society. The authors contest the global nature of risk proposed by Beck by arguing, "actual risks generally prove to be related to victims 'socio-economic' as well as 'socio-geographic' location" (Alario and Freudenberg 2010, 1). The authors to explore "the main axis of social theoretical division [regarding risk]: transcendence or exacerbation of socio-economic and socio-geographic divisions" (Alario and Freudenberg 2010, 1).

Alario and Freudenberg use the *Titanic* shipwreck (1912) to illustrate their position that class cannot be separated from risk and that risk has not replaced class as a dominant social paradigm. During the shipwreck, a higher proportion of first-class passengers survived because unlike lower-class passengers, they were given ample warning about the ship's infamous collision with the iceberg and were provided with more lifeboats. The authors theorize that the same principle applies to risk in contemporary society: "risks have been socially structured, falling predominantly on those without the power or wealth to travel in the first-class sections of society" (Alario and Freudenberg 2010, 2).

In the first part of the article, the authors outline the work of Beck and Giddens. Giddens (like Beck) speaks of risks that "transcend all values and all exclusionary divisions of

power” (Giddens 1990, 124 and 125). However, Giddens differs from Beck in that he believes that the expert knowledge and expert systems resulting from further scientific innovation will ultimately mitigate the consequences of modernity (as described by Beck). Conversely, Beck argues that “scientific and technological systems have a demonstrable record of destruction, as well as a demonstrated inability to control the kinds of risks that such systems have manufactured” (Alario and Freudenberg 2010, 4). Nonetheless,

Even if poverty afflicts a significant fraction of the population in the context of a class society, and even if it characterizes the majority of the world's population, both Giddens and Beck see the global risk society as being characterized by the kind of mega-threats that are boundless and knows of no conventional socio-economic, political, or socio-geographic boundaries. (Alario and Freudenberg 2010, 5)

The authors refer to a number of empirical studies on climate change as evidence that global warming is generating risk. “Although the scientists take pains to note that these overall patterns cannot be said to have ‘caused’ individual storms, such as Hurricane Katrina, the patterns *can* be said to be likely to lead to a higher probability of Katrina-type storms” (Alario and Freudenberg 2010, 7). The authors point out that in the case of Katrina, “suffering was concentrated predominantly among those who were old and poor, and the diaspora has been particularly pronounced for those who are Black rather than White” (Alario and Freudenberg 2010, 7). The authors use the Katrina example (as well as other empirical data) to illustrate their position that even when risks appear to be global in nature (such as global warming), the impacts of risk will ultimately be localized and are likely to be disproportionate. “Even these vast risks

tend to be distributed in socially structured ways, reinforced by global, political and economic structures that perpetuate the disproportional use and abuse of the natural environment and its natural resources” (Alario and Freudenberg 2010, 9).

The authors conclude that popular theories regarding risk society fail to recognize “the striking inequalities and blunt injustices that occur in the exposure of environmental risks and the destruction of nature...what we have witnessed at the beginning of the 21st century goes against Giddens’s and Beck’s understanding of risk...” (Alario and Freudenberg 2010, 10). Finally, the authors call for more research on Titanic risks that explore the topic of risk in light of inequality, and for scholars to ultimately revisit other theories regarding risk.

In summary, modernity not only ushered in an era of unprecedented progress, but also introduced society to new dangers. Reflexive modernity follows modernity as an approach to reassessing the consequences of modernity and addressing them (Giddens 1990). While scholars such as Giddens and Lash (Beck, et al 1994) state that reflexive modernity dictates that society will continue to rely on science and innovation as a means of mitigating the consequences of modernity, Beck argues that such means are inadequate. Beck’s (2009) theory of world risk society holds that the modern worldview and modern institutions will not mitigate the delocalized, global risks generated by modernity. He states that cosmopolitanism will give rise to subpolitical movements that will transcend modern institutions and provide the means for global risks to be addressed across traditional societal cleavages such as race and class.

Critics of the risk society theory such as Alario (1993); Olafsson and Ohman (2007); and Alario and Freudenburg (2010) contend that risk cannot be separated from traditional societal cleavages and that risks will continue to be experienced unevenly along the lines of

class, etc. The thrust of such critiques is that even in the face of global risks, the less affluent will continue to be more vulnerable than others and more susceptible to the adverse effects of risk.

Beck, Giddens, and Lash's theories regarding risk are relevant to this study in that they conceptualize risk in contemporary society as the consequence of the successes of modernity. The construction of the Industrial Canal was executed for the purpose of furthering international commerce, as well as accommodating shipping and emerging shipbuilding interests in New Orleans. The Industrial Canal was an ideal-typical modern megaproject that incorporated the latest canal-building technology. Likewise, the bridges traversing the Industrial Canal and the levees and floodwalls erected along its banks were all the products of science and innovation. Both the Industrial Canal and its accessory structures had the effect of stimulating growth in the Lower Ninth Ward and ultimately imperiling more life and property. The Industrial Canal and Lower Ninth Ward subjects do in fact provide empirical evidence that risks have been generated by the successes of modernity and that society must now cope with the associated consequences.

2.2 Vulnerability

Although there are many forms of vulnerability, *social* vulnerability is perhaps the most comprehensive classification of vulnerability because it typically includes both political and economic components. According to Pelling (2003), "vulnerability can be indicated in the city by exposure to risk, economic poverty/inequality and political marginality" (182). Like political vulnerability, economic vulnerability can also lead to a lack of access to decision-making processes for the less affluent. As Logan and Molotch (1987) point out, "the most vulnerable participants in place markets are those with the fewest alternatives" (23).

Beck himself recognizes that risk and social vulnerability are closely related. "Risk presupposes a decision, hence a decision-maker, and produces a radical asymmetry between

those who take, define and profit from risks and those who are their targets” (Beck 2009, 140). He recognizes the concept of *social vulnerability* to include “the means and possibilities made available to individuals, societies or whole populations to cope (or not) with the risks—the ‘unknown unknowns’—and the (social) uncertainties that mark their lives” (Beck 2009, 178). However, Beck also states that social vulnerability “cannot be precisely delimited either in space or time” without examining the context of its origin, particularly as it pertains to decision-makers (Beck 2009, 179).

Beck describes Hurricane Katrina as a *natural* occurrence in which “black districts...were destroyed by the storm tides because of their social vulnerability. Thus it does not seem to fit with the conceptual scheme that attributes catastrophes to human decisions rather than to nature” (Beck 2009, 57). Beck fails to recognize the role human decisions played in exacerbating the impacts of Hurricane Katrina in New Orleans. Nonetheless, his approach to the Katrina event is indicative of his position that risk is now being globalized and delocalized.

Even if poverty afflicts a significant fraction of the population in the context of a class society, and even if it characterizes the majority of the world's population, both Giddens and Beck see the global risk society as being characterized by the kind of mega-threats that are boundless and knows of no conventional socio-economic, political, or socio-geographic boundaries. (Alario and Freudenberg 2010, 5)

Hewitt (1983) “argued that natural disasters should be seen as an ongoing relationship between society and nature, not as one-off, extreme events taking place outside of development” (Pelling 2003, 47). Hewitt’s view of vulnerability is consistent with the human ecology tradition,

where vulnerability tends to be measured purely by level of exposure. Other theorists focused more exclusively on vulnerability at the micro-level (individuals, households and communities), taking a broad approach to the social attributes that produce vulnerability.

The *ratchet effect of vulnerability* (Chambers 1989) is a concept that explains how frequent exposure to risk and succeeding hazard events in a given community gradually increases its vulnerability over time while decreasing its ability to cope with risk. “In cities the ratchet effect will be generated and felt by people having to live with multiple risk types—crime and violence, disease, unemployment, pollution and technological hazard—as well as environmental hazard” (Pelling 2003, 16). This micro-level approach to vulnerability is unique in that it focuses on the cumulative effects of risk exposure.

The *livelihood approach to vulnerability* (Sen 1981) holds that “the susceptibility of an individual or group to environmental risk is understood as an outcome of their access to economic, social, political, physical, and environmental assets” (Pelling 2003, 67). Building on this approach, Swift (1989) proposes gauging household assets as a means of determining vulnerability:

During times of security, assets could be accumulated...and then during times of stress of shock these assets would be available to protect the household from hazardous impacts...Asset profiles act as informal insurance against future uncertainty (economic or environmental), and it is patterns of asset investment as well as their quantity that determine susceptibility to hazardous impacts...

(Pelling 2003, 50-51)

Blaikie, et al (1994) present environmental hazard and human vulnerability as “the local outcome of progressions from root causes (global political economy, global climate change), via intervening dynamic pressures that link global or historical forces with the immediate conditions” (Pelling 2003, 47). According to this perspective, vulnerability is a matter of exposure, resistance, and resilience.

As the theoretical approaches to vulnerability taken by Chambers (1989); Sen (1981); Swift (1989); and Blaikie, et al (1994) indicate, approaches to vulnerability greatly differ from the aforementioned approaches to risk in that they are focused more on individual, highly-localized attributes than they are on macrostructures. Because such attributes are so complex and individualized, approaches to mitigating social vulnerability must also be complex and inclusive of social, political and economic components (Pelling 2003).

2.3 Conclusion

Theorists such as Beck, Giddens, and Lash agree that new risks have been generated as a consequence of modernity. While Giddens and Lash state that such risks will ultimately be mitigated by the development of expert systems via a continuation of modern principles (science and innovation) and modern institutions (such as the global economy), Beck argues that such modern entities are ill suited for the task. The Industrial Canal and all of its components (locks, levees, floodwalls, and bridges) are the products of modern principles and institutions, and as such have generated risks for the Lower Ninth Ward. Giddens and Lash may provide an analysis in that their assessment that modern principles and institutions will continue to use science and innovation to mitigate the risks they have generated. Such an approach is supported by the enhanced levee/floodwall systems and other structural mitigation measures that have been

instituted over the past several decades as a means of protecting life and property near the Industrial Canal.

In Beck's view, modern principles and institutions are part of the problem rather than the solution. Beck contends that due to the increasingly global nature of risks (world risk society), exposure to risk will transcend modern principles and institutions, political borders, and race and class as the new dominant social paradigm. Within this context, Beck asserts that subpolitical movements may best address risks:

...dangers are being produced by industry, externalized by economics, individualized by the legal system, legitimized by the natural sciences and downplayed by politics. That this is undermining the power and credibility of institutions only becomes apparent when the system is put to the test by Greenpeace...[or] al-Qaeda. The result is the subpoliticization of world society. (Beck 2009, 95)

Beck's assertion that risk will transcend modern principles and institutions and replace race and class as dominant social paradigms is questionable. Furthermore, his views on the global nature and delocalization of risks run counter to the empirical evidence pertaining to the Industrial Canal and Lower Ninth Ward. Given that the risks associated with the Industrial Canal have thus far been highly localized and have disproportionately impacted working-class African-Americans, the Titanic risk theory set forth by Alario and Freudenberg seems more appropriate.

The globalized, macro-level approach to risk and vulnerability taken by Beck stands in sharp contrast to the highly localized, micro-level approach to vulnerability taken by other scholars (Chambers 1989; Sen 1981; Swift 1989; Blaikie, et al 1994). Social vulnerability

(including its political and economic components) is commonly approached as an outcome of sets of individual attributes that are certainly influenced by external forces, but are not as indiscriminately applied across the world as Beck would suggest. Approaches to mitigating social vulnerability must be as varied and complex as the attributes that cause it (Pelling 2003).

3 Literature Review

The literature regarding infrastructure projects and risk is critical to this study in that it explores how and why infrastructure projects such as the Industrial Canal are conceptualized, funded and ultimately developed. The risks associated with such projects (whether economic or social) and how such risks are dispersed throughout society speak to the ways in which infrastructure project “winners” and “losers” are distinguished (Bullard 1993). Given that the Industrial Canal has functioned as a *floodway* and exposed the Lower Ninth Ward to a great deal of risk over the past century, examining the effects of this specific and historic infrastructure project within this context is an integral part of this study.

The Industrial Canal has also functioned as a *physical barrier* between the Lower Ninth Ward and the rest of New Orleans, thereby impacting vulnerability in the neighborhood in many ways. Consequently, the literature regarding the relationship between isolation and vulnerability is also relevant to this study. Several scholars have found social and spatial isolation to be a common characteristic of distressed neighborhoods.

The persistence of exposure to hazards in the working-class, African-American Lower Ninth Ward also raises serious questions regarding the relationship between race and the environment. The literature on race and the environment is therefore critical to this study in that it articulates the ways in which race and class have a bearing on where people live, ultimately dictating their level of risk, vulnerability and exposure to hazards. More importantly, the literature on environmental racism and the environmental justice movement provide a basis for assessing the possibilities of addressing exposure to natural hazards within the traditional environmental justice framework.

Understanding the relationship between *spatial* vulnerability (based on geographic location and/or exposure to hazards) and *social* vulnerability (based on race, class or gender) is central to exploring the ways in which the Lower Ninth Ward neighborhood has not only been persistently exposed to hazards, but has also been slow to recover from hazard events or to successfully mitigate future hazards. Consequently, previous research that assesses the relationship between vulnerability and exposure to hazards is critical to gaining an understanding of the role vulnerability has played in the experiences of the Lower Ninth Ward over the past century.

3.1 Infrastructure Projects and Risk

The research questions posed in this study are related to the nature of the risks associated with the construction of major infrastructure projects and the resulting *social outcomes*. However, much of the literature on infrastructure projects and risk speaks of risk purely in economic terms. Although the social and environmental impacts of infrastructure projects are not analyzed in-depth in the literature, such impacts are certainly mentioned as inevitable byproducts of infrastructure project development.

Flyvbjerg, et al (2003) discuss how poorly large infrastructure projects typically perform in terms of both economics and the environment. “For environmental and social effects of projects, one...finds that such effects have not been taken account during project development, or they have been severely miscalculated” (Flyvbjerg, et al 2003, 4). Flyvbjerg and his colleagues are also critical of the public policy processes surrounding project decision-making and find that ultimately, “political inequality in access to decision-making processes will lead to an unequal distribution of risks, burdens and benefits from projects” (Flyvbjerg, et al 2003, 5). In the first half of the study the authors emphasize the problems with conventional

methods of project development, and in the second half they provide both theoretical and empirical evidence supporting their argument that greater emphasis on risk and accountability can improve such methods.

Analyzing a number of major infrastructure projects from around the world (including the Panama Canal and the Suez Canal), the authors identify a trend of project cost overruns; overestimated economic benefits; and the spreading of associated risks among the general public. Flyvbjerg, et al (2003) find that such aims are accomplished via a project development process that is typically dominated by special-interests who are fully engaged in rent-seeking behavior and are supported and legitimized by politicians who are capable of facilitating project funding.

If the government decides that the mode of implementation and operation should be a state-owned enterprise, and that the facility should be financed with public money...government takes on the role of being a producer of commercial services ...by directly or indirectly committing the wealth of ordinary people for financing or as collateral for the project. (Flyvbjerg, et al 2003, 90)

The authors find that there is an inherent conflict between the government functioning as both the promoter of a project and as the guardian of public interest issues such as safety and the environment.

In their final analysis, the authors call for greater transparency and openness in the project development process and a more sober calculation of the risks associated with such projects. A major deficiency in the study is that while the authors discuss risk in great detail and frequently allude to the social and environmental impacts of projects, they have a tendency to explain risk in purely economic terms. The study ultimately fails to address specific social and

environmental impacts of projects or to describe which sects of the population are most likely to bear the risks and burdens they describe.

Altshuler and Luberoff (2003) outline the evolution of major project development in the United States by identifying a number of specific megaproject eras during the 20th century and explaining the political dynamics of each. The authors find that the period between 1902 and 1927 (the same period in which the Industrial Canal was constructed) was a major turning point in megaproject development in the United States, as “local capital expenditures nearly quadrupled in real terms and rose from .7 percent to 1.5 percent of gross domestic product” (Altshuler and Luberoff 2003, 11). However, they identify the period between the 1950’s and 1960’s as the *Great Megaproject Era* and use the dominance of highway, airport and railway projects during this era to illustrate their point. The study indicates that between 1956 and 1967 alone, over 300,000 households were displaced by highway projects and that most of the displaced were poor minorities who did not have the political clout to thwart project impacts in their communities (Altshuler and Luberoff 2003, 83 and 84).

According to the study, the Great Megaproject Era died in the late 1960’s/early 1970’s when social movements around the United States led to stronger advocacy for potential “project victims” (those who stood to be adversely impacted by the construction of megaprojects) and when “megaproject advocates now had to satisfy the avoidance of disruptive side effects—on neighborhoods, parks, natural species, historic sites...” (Altshuler and Luberoff 2003, 28) This backlash from the Great Megaproject Era is what the authors refer to as the *Do No Harm* era. During the Do No Harm era (post-1970), the authors find that megaprojects rarely proceed when there would be “trivial” costs to neighborhoods and/or the natural environment, and that megaprojects ceased being “routine” in the US (Altshuler and Luberoff 2003, 220).

One major characteristic of the Do No Harm era are mitigation requirements. The nature of the Do No Harm concept coupled with mitigation requirements for new megaprojects have increased project costs to such a high degree that megaprojects are now less feasible (Altshuler and Luberoff 2003, 243). Despite the noted decline of megaproject development in the United States, Altshuler and Luberoff (2003) generally support the conclusions of Flyvbjerg, et al (2003): (1) People should be wary of projects which concentrate benefits into the hands of a few while passing along the associated costs and risks to others; and (2) Project development should be an open process which allows for public input and a fair assessment of potential project impacts (Altshuler and Luberoff 2003, 289). Similar to the Flyvbjerg study, the Altshuler and Luberoff study alludes to the social/environmental harm caused by project development but fails to elaborate on exactly what these are or what their consequences have been.

In an earlier study, Flyvbjerg (1998) uses Aalborg, Denmark as a case study to illustrate how power is exercised and rationality is defined during project development. The author finds that during the proposal, design, construction and implementation phases of a bus terminal project in Aalborg, that “analysis, instead of acting as a foundation of intelligent policymaking, becomes a manipulated instrument of politics” for powerful project boosters (Flyvbjerg 1998, 35). By ignoring factual information regarding potential project impacts and instead choosing to exercise raw political power to achieve desired ends, the study finds that project boosters essentially produce “that knowledge and that rationality which is conducive to the reality it wants” (Flyvbjerg 1998, 36).

As a result of project boosters’ imposition of its own reality regarding project development, Flyvbjerg finds that rational arguments regarding a project’s potential adverse impacts are invalidated. Consequently, concerns regarding projects are silenced and they move

forward despite any undesirable consequences, leading Flyvbjerg to ultimately conclude that “rationality is context-dependent; the context of rationality is power; and power blurs the line between rationality and rationalization” (Flyvbjerg 1998, 97). The findings of *Rationality and Power* are certainly related to those of Flyvbjerg’s later work (2003) and Altshuler’s work (2003) in that they also speak to the issues of transparency and public input during the project planning process. These deficiencies are all conducive to the uneven distribution of risk and the creation of clear project “winners” and “losers” (Bullard 1993).

Although Flyvbjerg (1998); Flyvbjerg, et al (2003); and Altshuler and Luberoff (2003) tend to focus more on traditional transportation infrastructure projects such as highways and railways, other scholars have more squarely addressed issues surrounding the impacts of water navigation projects such as the Industrial Canal. Freudenburg, et al (2009) pose the following question regarding water navigation projects in the New Orleans metropolitan area: “Why [have] so many of the energetic and ingenious applications of engineering in this [New Orleans] region had the long-term effect of rendering that ‘wretched’ site so much more fragile than it had been before?” (Freudenburg, et al 2009, 11)

Similar to Flyvbjerg, et al (2003), Freudenburg, et al (2009) find that water navigation projects promoted in the name of economic development have typically had a poor track record in terms of economic benefits and harmful environmental impacts. Such findings are consistent with the authors’ initial claim that “much or most of environmental harm in the United States is highly disproportionate to actual levels of economic activity” (Freudenburg, et al 2009, 59). The study uses the Industrial Canal, Gulf Intracoastal Waterway, and Mississippi River Gulf Outlet navigation canals as examples of projects that have underperformed economically and

contributed to the devastation resulting from disasters such as Hurricane Katrina (2005) in the New Orleans area.

Like Flyvbjerg (1998); Flyvbjerg, et al (2003); and Altshuler and Luberoff (2003), Freudenburg, et al (2009) highlight the role that growth coalitions play in the project development process and how risks are typically unevenly distributed (in the case of New Orleans, this is expressed as flood risk). In the conclusion of the study, the authors outline what they see as a historical pattern in the construction of water navigation projects and risk in New Orleans:

First, the hubris of a small number of “great” or at least politically powerful people unleashes serious environmental harm. Second, the environmental harm worsens “natural” hazards, creating damage not just to nature, but also to other humans and the economy. Third ...the consequences will usually be the most severe not for those who have started the cycles of suffering, but for others. (Freudenburg, et al 2009, 168)

In terms of this study, the most critical element of Freudenburg, et al’s work is that the study highlights actual *hazards* as a byproduct of the risks generated by infrastructure project development.

Azcona (2006) also addresses the uneven distribution of hazards associated with water navigation projects in the New Orleans area and specifically discusses the exacerbation of exposure to flood hazards as a social and environmental justice issue. He examines the force of local growth coalitions in New Orleans (most notably the Dock Board) and how they were able to “remake the built environment...of the Lower Ninth Ward in the interests of the local

aristocracy and at the expense of local residents” (Azcona 2006, 72). Similar to Freudenburg, et al (2009), Azcona’s findings lead him to conclude that the damage caused by Hurricane Katrina was the culmination of years of failed engineering and the uneven assignment of risk to certain sects of society in the name of economic development.

Freudenburg, et al (2008) previously addressed the issue of hazard-creation disguised as economic development. The authors introduce the concepts of “rent-seeking” and “hiding risks” as components of political processes that aid project boosters in maximizing their profits at the expense of others (Freudenburg, et al 2008, 1021 and 1022). The dual themes of rent-seeking and hiding risks identified by Freudenburg are consistent with the findings of the previous studies conducted by Flyvbjerg (1998); Flyvbjerg, et al (2003); Altshuler and Luberoff (2003); and Azcona (2006), and are once again highlighted in the findings of his own 2009 study (Freudenburg, et al 2009).

Gellert and Lynch (2003) argue that infrastructure project displacement should be discussed not simply in terms of its natural or material dimensions, but also in terms of its social dimensions. The authors make a distinction between primary and secondary displacements, and between the associated resulting biogeophysical and social consequences. The authors also find that “those who imagine, define, and transform landscapes bring about material changes in the biogeophysical environment, which in turn influence social organization, values, understandings, and actions” (Gellert and Lynch 2003, 17). The authors conclude that megaproject displacement is more likely to adversely impact the less affluent, and that the changing landscape resulting from infrastructure project development will often give obvious clues as to who the project “winners and losers” are (Gellert and Lynch 2003, 23).

The literature on infrastructure and risk suggests that major infrastructure projects typically fail to live up to economic expectations and tend to generate and unevenly distribute risks (Flyvbjerg 1998; Flyvbjerg, et al 2003; Altshuler and Luberoff 2003; Freudenburg, et al 2008 and 2009; Azcona 2006). Such risks impact society in various ways (economically, socially and/or environmentally), and are more likely to adversely impact the less affluent (Flyvbjerg, et al 2003; Freudenburg, et al 2008 and 2009; Azcona 2006; Logan and Molotch 1987; Gellert and Lynch 2003). Scholars are critical of the political processes surrounding project development, and generally suggest that such processes should be more open and that decision-makers should be more realistic about potential adverse impacts (Flyvbjerg 1998; Flyvbjerg, et al 2003; Altshuler and Luberoff 2003; Freudenburg, et al 2008 and 2009; Azcona 2006). However, with the exception of the Freudenburg, et al (2009) and Azcona (2006) studies, much of the literature on infrastructure projects and risk fails to directly address exposure to hazards as a risk generated as a byproduct of project development.

The Industrial Canal/Lower Ninth Ward case study will squarely address many of the concepts discussed in these studies. The case study will contribute to the literature by providing over one century of data pertaining to the social and environmental impacts of a major infrastructure project (the Industrial Canal) on a working-class, African-American neighborhood (the Lower Ninth Ward). Additionally, the final analysis of the case study will articulate the relationship between infrastructure projects, risk and exposure to hazards and thus add to the existing literature.

3.2 Isolation and Vulnerability

Several scholars have introduced spatial and social isolation as a common characteristic of distressed neighborhoods (Logan and Molotch 1987; Marcuse 1997; Freeman 2006; Dyson

2006; Wacquant 2008). Much of this literature uses the term ‘ghetto’ as concept to describe isolation caused by structural conditions beyond a location. While the area under study is not being defined as a ghetto, the literature is useful to discussion isolation and vulnerability. According to Wacquant, a ghetto “can be characterized ideal-typically as a bounded, ethnically uniform sociospatial formation born of the forcible relegation of a negatively typed population...” (Wacquant 2008, 49). He defines the concept of the *hyperghetto* as a “territorial and organizational configuration characterized by conjugated segregation on the basis of race and class...” (Wacquant 2008, 3). According to Wacquant, “spatial isolation operates in the manner of a prism that intensifies and concentrates hardship inside the hyperghetto” (Wacquant 2008, 75). Dyson (2006) similarly finds that in the United States, the ghetto can best be described as an isolated and concentrated pocket of poverty and despair. Likewise, Freeman (2006); Marcuse (1997); and Logan and Molotch (1987) also highlight isolation as a common characteristic of the ghetto.

Wacquant finds that both the United States ghetto and the French *banlieue* (ghetto) have in common a “bleak and oppressive atmosphere that suffuses them and the potent stigma associated with living in a bounded urban area publicly regarded as a place of relegation...” (Wacquant 2008, 147). This phenomenon is what Wacquant frequently refers to as *advanced marginality*, and he outlines its six distinctive features. Two of the six distinctive features are highly relevant to the study of the Industrial Canal and Lower Ninth Ward:

- (1) *Territorial fixation and stigmatization*: “...advanced marginality tends to be concentrated in isolated and bounded territories increasingly perceived by both outsiders and insiders as social purgatories...” (Wacquant 2008, 237) This

phenomenon also has implications for public policy regarding such areas, further marginalizing inhabitants by “render[ing] them invisible, or driv[ing] them out of a coveted space” (Wacquant 2008, 240).

(2) *Spatial alienation and the dissolution of place*: The modern hyperghetto “has become a vector of intra-communal division and an instrument for the virtual imprisonment of the African-American urban subproletariat, a dreaded and detested territory” (Wacquant 2008, 242).

Wacquant ultimately finds that the United States ghetto and the French banlieue are structurally distinct, and that the ghettos of Europe are not being “westernized” as many other scholars have found. However, the study does highlight some commonalities and worldwide trends regarding his concepts of hyperghetto and advanced marginality that have serious implications in terms of the relationship between isolation (also alienation and stigmatization) and vulnerability.

Logan and Molotch (1987) also address the social and spatial features of the ghetto. The authors find that a lack of historical business traditions and decades of racially-motivated exclusionary practices by whites have created ghetto housing patterns and vulnerability among the African-American population in the United States. They cite a number of studies which point to economic failures within the African-American community as also leading to a more consumption-oriented economy which wields little influence outside of the boundaries of the African-American neighborhood (such as churches, liquor stores, etc.).

Logan and Molotch claim that while institutions such as churches are important to African-American neighborhoods, they do not compensate “for the absence of an indigenous exchange value engine” (1987, 130). Consequently, “in the ghetto, the pursuit of exchange values is almost totally in the hands of outsiders...the people who own and control the ghetto...live elsewhere and have little stake in enhancing the use values of residents (Logan and Molotch 1987, 132). Ghetto residents therefore have little control over their own destiny and well-being, leading outsiders to believe that “there is nothing worth preserving in the ghetto, making almost all African-American people’s homelands appropriate candidates for any reuse that will serve the growth needs of the metropolis” (Logan and Molotch 1987, 134). Ward (1989) similarly finds that that such spaces in the United States are characterized by “exclusion from a more complex, segmented world defined by varied patterns of consumption,” where “a limited access to resources is decisively compounded by environmental disabilities and ethnic or racial discrimination” (Ward 1989, 146 and 217).

Freeman (2006) describes how civil unrest during the 1960’s had the effect of exacerbating white flight and causing disinvestment in African-American neighborhoods in Harlem, New York, causing abandonment to “become the defining feature of many a ghetto” (Freeman 2006, 188). Additionally, Freeman finds that “the otherness of the ghetto is more than just a manifestation of it being populated by people of a different race...the ghetto is thought to be unique in its *degree of spatial isolation* [emphasis added]” (Freeman 2006, 189). Freeman also cites the previous findings of Marcuse (1997), who found that “the black ghetto of today is a substantially different ghetto from the classic ghetto: It is an outcast ghetto, and those within it are subject to exclusion from the mainstream of the economic, social, and political life of the city” (Marcuse 1997, 228). Consistent with the findings of Wacquant (2008), Logan and Molotch

(1987); Freeman (2006); and Marcuse (1997) all speak to the many forms of isolation that are typical of the United States ghetto. Such findings are relevant to any analysis of the Lower Ninth Ward, a community that has historically been isolated from New Orleans both spatially and socially by the Industrial Canal even though the neighborhood's racial composition has evolved over time.

Despite the Lower Ninth Ward's attributes as an isolated and distressed neighborhood, high rates of homeownership have been a hallmark of the Lower Ninth Ward for generations. In 1974, the homeownership rate in the neighborhood was said to have been at 54.1% (Lower Ninth Ward 1974). A separate report measuring "owner-occupied" housing units in the Lower Ninth Ward in 1975 indicated that 69% of all housing units in the neighborhood were owner-occupied at the time (Landrieu 1975). While overall homeownership in New Orleans was 46.5% as of 2000, homeownership in the Lower Ninth Ward was at 59% (Greater New Orleans Community Data Center 2012). According to the United States Census (2010), 66.4% of all housing units in the Lower Ninth Ward were owner-occupied as of 2010.

Although the Lower Ninth Ward was considered 100% urban by the US Census in 2000 (based on population density), its high homeownership rates and semi-rural "bucolic" feel reveal a certain degree of suburban character in the neighborhood (Landphair 1999; 2007). Such characteristics present a contradictory picture of the Lower Ninth Ward—while this place presents issues of vulnerability, the Lower Ninth Ward also presents characteristics of a small, cohesive neighborhood with significant strengths. The literature on suburbanization and African-American suburbanization in the United States (Jackson 1985 and Wiese 2004) speaks to the tension between the distressed and suburban characteristics of the Lower Ninth Ward.

Jackson (1985) chronicles the phenomenon of suburbanization in the United States and “attempts to account for the divergence of the American experience from that of the rest of the world” (Jackson 1985, 10). The author provides a detailed account of the many factors that contributed to rapid suburbanization in the United States, and ultimately finds that the American experience was indeed quite unique in comparison to other parts of the world. Jackson emphasizes how federal policies shaped the real estate market and fostered suburbanization in the United States. Jackson also quotes architectural scholar Oscar Newman, who provides a number of common attributes of safe housing developments, including: (1) the capacity of an area to create perceived territorial influence; and (2) the capacity of design to decrease the occupants’ perception of isolation and stigma (Jackson 1985, 228). Jackson lists the primary characteristics of the postwar suburbs, and states that the most important characteristic was “economic and racial homogeneity” (Jackson 1985, 241).

Weise (2004) builds on the work of Jackson by seeking to “re-conceptualize suburbanization to encompass the whole expansion of American cities beyond their limits, not just the celebrated decentralization of the white middle class” (Weise 2004, 6). In doing so, he analyzes African-American suburbanization throughout the twentieth century and explains the many cultural, political and institutional trends that affected African-American suburbanization over time. He also goes into great detail explaining that while the motivation to move into the suburbs was virtually the same for whites and African-Americans, that the process and the outcomes of seeking life in suburbia have been quite different for African-Americans in the US. African-American suburbs differed from white suburbs in that they “occupied cheap, often nuisance-prone land. Many were geographically cut off by railroads or other physical

barriers...many African-American suburbs also lacked basic public infrastructure” (Weise 2004, 17).

Weise finds that as with whites, African-American suburbanization took place in tandem with various social movements in the United States throughout the twentieth century, but that African-American suburbanization was different in that blacks seeking lives in the suburbs were consistently challenged because of race. However, the author does point out that while African-American suburbanization pressed forward despite many obstacles, that it ultimately reinforced many of the existing segregated spatial patterns of the inner city, and that African-American suburban space was typically “separate and unequal” to that of whites. Weise concludes by stating that “home to half of the nation’s population, more than a third of the nation’s African-Americans, and large numbers of Latinos and Asian-Americans, suburbia was the context in which much of the struggle over class; color; and power in the twenty-first century would take place” (Weise 2004, 288).

Weise warns that due to the intentional selection of problematic and/or undesirable sites for African-American suburbs, such neighborhoods have historically had sustainability issues and may be prone to becoming slums in the future. Ultimately, even the literature on suburbanization and African-American suburbanization indicates that African-Americans have been isolated and relegated to less-desirable sites *even in the suburbs* (Jackson 1985; Weise 2004). Such findings may have implications in terms of the relationship between race and environmental hazards.

3.3 Race and the Environment

As indicated by Flyvbjerg (1998); Flyvbjerg, et al (2003); Altshuler and Luberoff (2003); and Azcona (2006), exposure to risks associated with infrastructure projects is often a

product of a lack of political influence on the part of those who are subjected to the adverse impacts associated with such projects. Powerful commercial interests and sympathetic government officials often serve as project boosters, and they are careful not to upset the more affluent sects of society when engaging in the development of infrastructure projects. Undoubtedly, such an arrangement has serious implications for the less affluent, particularly minorities and the poor.

Logan and Molotch (1987) describe and outline the dynamics of the “growth machine” and articulate the friction between property “use” and “exchange” values. In terms of property markets, the authors point out that “the most vulnerable participants in place markets are those with the fewest alternatives” (Logan and Molotch 1987, 23). This assertion is consistent with the findings of other studies (Flyvbjerg 1998; Flyvbjerg, et al 2003; Altshuler and Luberoff 2003; Azcona 2006; Freudenburg 2008; Freudenburg, et al 2009) in that it articulates the plight of those less fortunate, who must contend with environmental consequences and infringements upon the *use* value of their property as a byproduct of the *exchange* values sought by the more affluent. This approach is consistent with that of Titanic risk theory, which describes risk exposure as an outcome of place inequality.

Logan and Molotch (1987) find that poor neighborhoods are chronically targeted for the construction of undesirable infrastructure projects in the United States, and therefore bear a disproportionate amount of associated environmental impacts. “Blows to the environment most heavily affect the less well to do... [and] the poor are more affected by growth induced environmental decay than are the rich” (Logan and Molotch 1987, 95 and 96). While Logan and Molotch (1987) consider things such as pollution a typical form of environmental decay and fail to address increased exposure to hazards as a social and environmental justice issue, their

findings are clear: When it comes to growth and development (including the associated construction of infrastructure projects) in the United States, the poor and minorities are more likely to be adversely impacted.

Bullard (1993) more directly addresses issues related to the disproportionate impact of environmental degradation on minorities in the United States. The impetus for the study was that “the struggle for environmental justice has intensified in communities that have become ‘sacrifice zones’” and that United States domestic policy regarding the environment has had the effect of “targeting low-income, disenfranchised communities of color” (Bullard 1993, 4 and 5). Bullard (1993) claims that as a product of institutional relationships between the government and private industry, people of color are disproportionately exposed to environmental and health risks in their communities. Contrary to other scholars’ findings that the benefits of growth and development are concentrated and risks are diffused, Bullard finds that in terms of exposure to environmental risks, “...costs are localized: risks increase with proximity to the source and are borne by those living nearby, while the benefits are dispersed throughout the larger society” (Bullard 1993, 13). Since race continues to be such a strong predictor of where people live, Bullard claims that risks tend to be perpetuated along racial lines. Bullard’s claims are consistent with the findings of Logan and Molotch (1987) in that they describe the relationship between the lack of “place alternatives” by minorities and the associated environmental and social consequences.

Bullard is also critical of the mainstream environmental movement, which he claims does not sufficiently address the fact that “social inequality and imbalances of social power are at the heart of environmental degradation” (1993, 23). On a global scale, Bullard (1993) found that “the same domestic pattern of disproportionate exposure to environmental hazards and

degradation exists worldwide among those who are nonwhite, poor, less educated, and politically less powerful” (Bullard 1993, 179). Similarly, Bryant and Mohai (1992) reference a 1987 study conducted by the United Church of Christ that found that “among a variety of indicators race was the best predictor of the location of hazardous waste facilities in the US” (Bryant and Mohai 1992, 2). The study examines a wide range of environmental ills in the United States ranging from hazardous waste facilities to the consumption of toxic fish. Similar to Bullard (1993), the dominant theme in the study is the disproportionate impact such hazards have on minority communities.

As the literature on infrastructure and risk suggests, there are risks and consequences associated with the construction of major infrastructure projects that are more likely to adversely impact the less affluent. Likewise, the literature on race and the environment suggests that the less affluent are also more likely to be exposed to other environmental hazards such as hazardous waste sites (Logan and Molotch 1987; Bullard 1993; Bryant and Mohai 1992). While race is addressed as a factor in the larger environmental movement, the literature on race and the environment fails to address the exacerbation of exposure to natural hazards such as floods as a mainstream environmental justice issue. “Sacrifice zones” are by definition already vulnerable sites that are home to vulnerable populations, and the immediate threats posed by natural hazards to such areas must also be taken into account as environmental justice issues, particularly when increased exposure is *imposed* by the actions of others.

Hurley (1995); Bullard (1993); and Bryant and Mohai (1992) all point to empirical evidence that the poor and minorities have been disproportionately impacted by adverse environmental conditions due to their inability to resist politically and because of their relegation to less desirable geographic areas.

Historically, the ability to control others through the political process and through the dynamics of the capitalist marketplace... has proved a reliable predictor of one's ability to advance and secure a set of environmental objectives. For much of the history of the United States, this hierarchy was based on race and class. (Hurley 1995, 3)

Logan and Molotch (1987); Bryant and Mohai (1992); Bullard (1993); Alario (1993); Hurley (1995); and Alario and Freudenburg (2010) show that there are disproportionate adverse impacts on minorities from environmental risks and hazards. The authors attribute this phenomenon to place inequalities resulting from manipulation of markets (Logan and Molotch 1987); ongoing racial and ethnic conflicts that result in minorities bearing the greatest environmental risks (Alario 1993); and the social structuring of risks and environmental hazards (Bryant and Mohai 1992; Bullard 1993; Alario 1993; Hurley 1995; Alario and Freudenburg 2010).

The inequality among individuals thus not only results from the differentiation of places but also causes it. Similarly, place inequality is both cause and consequence of differences among places. Those in control of the top spaces use place status to maintain privileges for their locations, often at the expense of the lesser locales. (Logan and Molotch 1987, 49)

Cole and Foster (2001) found that "environmental hazards are inequitably distributed in the United States, with poor people and people of color bearing the greater share of pollution than richer people and white people" (296). The authors caution against "lifestyle" and "market-

dynamics” approaches to explaining the plight of minorities and the poor as it pertains the environment (Cole and Foster 2001, 1191 and 1192). Instead, they point to a lack of “place alternatives” (Logan and Molotch 1987) and housing discrimination as the means by which the poor and minorities become disproportionately exposed to environmental hazards (Cole and Foster 2001). The study ultimately finds that “spatial segregation and isolation are key features of racial inequality in our society... [and that] the concerns of such communities are rarely taken seriously in the political process, and are often ignored altogether” (Cole and Foster 2001).

The environmental justice movement began as a crusade by African-Americans in the South against “environmental racism,” but was later expanded to address the poor and other minorities’ struggles against the unequal distribution of environmental hazards throughout the United States (Bullard 1990, 1994; Roberts and Toffolon-Weiss 2001; Cole and Foster 2001; Sandler and Pezzullo 2007). Despite the growth of the environmental justice movement over the past several decades, it has typically been limited to addressing issues relative to pollution and waste disposal.

The African-American community was initially reluctant to engage in the environmental movement in the 1960’s because issues relative to civil rights were a higher priority in that community. However, Bryant and Mohai (1992) found that “people of color are beginning to realize that issues of environmental degradation, economics, power, politics, and racism are intricately interwoven and cannot be separated” (Bryant and Mohai 1992, 6). The environmental *justice* movement, which has been focused on the impacts of environmental hazards on various social groups, has since provided African-Americans with a vehicle for “integrating environmental issues into traditional civil rights agendas...” (Bryant and Mohai 1992, 95) However, despite the parallels between the structural inequalities that generate

traditional environmental justice issues and those that exacerbate exposure to natural hazards such as floods, exposure to natural hazards is typically not treated as a mainstream environmental justice issue.

Rivera and Miller (2007) argue that racial inequity and natural disasters should be given much more consideration in the larger environmental justice movement. The authors use evidence from a number of case studies to illustrate the argument that natural disasters have “set in motion patterns of change not only to the physical landscapes but also to the demographic and cultural environments” in the African-American community (Rivera and Miller 2007, 503).

The findings of the Rivera and Miller (2007) study suggest that places such as New Orleans constitute *zones of sacrifice* (as defined above by Bullard) where African-Americans are forced to bear the brunt of catastrophes and to “fend for themselves” in the aftermath (Rivera and Miller 2007, 516). The authors conclude that:

Natural disasters have had a profound and direct influence on the migration patterns of African-Americans because of their inability to be given sufficient attention in the advent of emergency situations. Although this directly affects the viability of the African-American communities within disaster affected regions, it has a significant effect on the social structure of locations where they immigrate to, creating social imbalances that have created racial animosity expressed through policy implementation, or lack thereof in the past. (Rivera and Miller 2007, 519)

In their study of race, the environment, and Hurricane Katrina, Bullard and Wright (2009) find that minorities and the poor were most affected by the storm. Furthermore, the

authors claim that African-American neighborhoods in New Orleans (such as the Lower Ninth Ward) continue to be the most likely to be severely impacted by future hurricane events, and that “increased levee protection maps closely correspond with race of neighborhoods (Bullard and Wright 2009, 1288).

The historical legacy of segregation and housing discrimination quite often dictated where African-Americans could live... It is no accident or chance happening where African-Americans live in New Orleans... Historically, affluent whites generally take the high ground, leaving to the poor, working-class, and African-Americans the more vulnerable low-lying land. (Bullard and Wright 2009, 6838)

The literature on race and the environment supports the notion that because African-Americans have historically had the fewest place alternatives, they have disproportionately been exposed to environmental hazards. Earlier studies (Logan and Molotch 1987; Bryant and Mohai 1992; Bullard 1993; Hurley 1995; Cole and Foster 2001) tend to address environmental hazards either in general terms or in terms specific to “traditional” environmental hazards such as pollution and/or residential proximity to landfills. Later studies (Rivera and Miller 2007; Freudenburg, et al 2009; Bullard and Wright 2009) more squarely address exposure to natural hazards such as floods as also having a disproportionate impact on the African-American community.

This study will build on this body of literature by utilizing empirical evidence regarding the Industrial Canal and Lower Ninth Ward as a means of arguing that due to adverse site selection, African-American communities may be disproportionately exposed to *both*

“traditional” and “natural” environmental hazards. Furthermore, this study will contribute to the literature on race and the environment by examining how exposure to environmental hazards such as floods might be addressed within the traditional environmental justice framework (similar to the way pollution is addressed).

3.4 Vulnerability and Hazards

Understanding the relationship between *spatial* (or physical) vulnerability (based on geographic location and/or exposure to hazards) and *social* vulnerability (based on race, class or gender) is central to exploring the ways in which the Lower Ninth Ward community has not only been persistently subjected to hazards, but has also been slow to recover from hazard events and unable to successfully mitigate the source of the hazards the community has experienced. Consequently, previous research which assesses the relationship between social vulnerability and exposure to flood hazards provides a basis for understanding the role social vulnerability has played in the experiences of the Lower Ninth Ward over the past century.

Pelling (2003) articulates the connection between exposure to risk as a product of power relations, environmental hazards as a social justice issue, and the manifestation of environmental hazards as actual disaster events. Pelling states that

To understand the geography of risk in the city we need to tackle both material and discursive forms of power. We need to identify the sources and uses of power that direct the distribution of resources in the city, and to understand this we need to be aware of the ideological positions of dominant actors in the city that justify decision-making for resource distribution. (Pelling 2003, 4)

Pelling's work builds on Chamber's (1989) concept *ratchet effect of vulnerability*. The ratchet effect of vulnerability is a concept that explains how frequent exposure to risk and succeeding hazard events in a given community gradually increase its vulnerability over time while decreasing its ability to cope with risk. "In cities the ratchet effect will be generated and felt by people having to live with multiple risk types—crime and violence, disease, unemployment, pollution and technological hazard—as well as environmental hazard" (Pelling 2003, 16).

Pelling (2003) seeks to examine the causes and consequences of vulnerability in cities. This approach is based on his analysis that both the inner city of medium-sized cities and the periphery of large cities are more likely than rural areas to be subjected to poverty and political marginalization, thus making them more vulnerable to environmental hazards and less capable of coping with them (Pelling 2003, 45). Pelling subscribes to the *livelihood approach* of assessing vulnerability in the city, which holds that "the susceptibility of an individual or group to environmental risk is understood as an outcome of their access to economic, social, political, physical, and environmental assets" (Pelling 2003, 67).

Pelling conducted case studies in Bridgetown, Barbados; Georgetown, Guyana; and Santo Domingo, Dominican Republic for the purpose of highlighting challenges and opportunities "for local action to confront vulnerability in contrasting political systems" in cities where environmental hazards have translated into experienced hazard events (and consequently, further vulnerability) (Pelling 2003, 93). He finds that in Barbados, economic modernization and development resulted in an increased level of exposure to environmental risk that has not been successfully mitigated despite the city's economic success (Pelling 2003, 115). He attributes this phenomenon to a lack of social capital and organized involvement in mitigation activities at the

local level. In Georgetown, Guyana, Pelling finds that the location of development has increasingly exposed people to flood hazards, but that the nation's poor economy has resulted in its failure to use available technology as a means of mitigating risk (Pelling 2003, 137). And in Santo Domingo, Pelling concludes that while non-governmental organizations (NGOs) have taken the lead in seeking mitigation funding from international actors (as a result of the national government being decentralized and in transition), that its unorganized mode of mitigating risk is ultimately unsustainable (Pelling 2003, 159).

In summary, Pelling's study begins by providing a review of theory regarding risk and vulnerability, and follows by outlining a framework by which such phenomena might best be measured in cities. He stresses the important role that social and political factors play in the "ratcheting effect" and the perpetuation of vulnerability in cities, and utilizes case studies as a means of empirically illustrating how risk and vulnerability are manifested and addressed (mitigated) within different social and political contexts.

Similar studies have been conducted around the world. Mustafa (1998) analyzes the socio-political factors associated with vulnerability and floods in Pakistan, and concludes that "the communities and social group's vulnerability were largely dependent upon the political and economic influence that the residents wielded" (Mustafa 1998, 300). Satterwaite (2003) similarly finds that in Africa, Asia, and Latin America, "the environmental problems that low-income groups face are often more related to inadequate provision of infrastructure and services...and a lack of political influence than a lack of income" (Satterwaite 2003, 80). The author further concludes that "a failure of governance underlies most environmental problems" (Satterwaite 2003, 89).

There is a consistent pattern within the literature: Commercial elites and government officials often impose environmental hazards and risks on the less affluent, who typically lack the social standing and political means to thwart infrastructure projects which will ultimately harm them. As Logan and Molotch (1987) find, the less affluent also have fewer “place alternatives” and have an especially difficult time avoiding such harm. Chambers (1989) finds that long-term exposure to environmental hazards makes already vulnerable communities exponentially weaker, creating a set of circumstances that prevent them from being able to properly cope with environmental hazards (Pelling 2003).

A 2002 report by the H. John Heinz III Center also highlights social and political factors that influence vulnerability to hazards. The authors cite the work of Cutter and her colleagues as the authority on population characteristics that influence social vulnerability. In terms of social vulnerability, the critical characteristics identified by Cutter, et al (2000; 2003) include socioeconomic status, race, age and gender. The authors find that “the population characteristics associated with social vulnerability are not randomly distributed throughout the United States. Rather, social vulnerability tends to be concentrated in pockets of high risk” (Heinz Center 2002, 48).

Cutter conducted a number of studies regarding social vulnerability and hazards in the United States. Cutter, et al (2000) “present a method for assessing vulnerability in spatial terms using both biophysical and social indicators” (Cutter, et al 2000, 713). The metrics used to assess social vulnerability in the study were based on a variation of the Social Vulnerability Index (SoVI). The researchers used twelve different environmental threats and eight SoVI social characteristics (such as socioeconomic status, race, age and gender) in order to provide a more thorough assessment of vulnerability than had previously been done by hazards researchers.

Unlike previous research, the Georgetown County, South Carolina case study used by Cutter, et al (2000) strongly accounts for the social factors contributing to vulnerability rather than focusing heavily of the nature and source of the hazards themselves.

The findings of the Georgetown County study suggest that those areas, which are spatially vulnerable due to their proximity to hazard sources, etc., are not necessarily also socially vulnerable. Some areas in Georgetown which are considered to be in dangerous areas (spatially vulnerable) such as floodplains are actually quite resilient due to the financial resources of their inhabitants, and can therefore withstand major hazard events. Conversely, some areas in the county that are not as spatially vulnerable were found to be less resilient due to their social vulnerability, and possibly subject to major disruption during relatively minor hazard events. The findings of this study have implications in terms of how critical social vulnerability is both during and after hazard events.

Cutter, et al (2003) later embarks on an even more ambitious study regarding social vulnerability and hazards. Stating a deficiency in the research regarding the quantification of social vulnerability, Cutter and her colleagues used SoVI variables to quantify and assess county-level social vulnerability nationwide for the purpose of facilitating further comparative study of such phenomena.

Social vulnerability is partially the product of social inequalities—those social factors that influence or shape the susceptibility of various groups to harm and that also govern their ability to respond. However, it also includes place inequalities—those characteristics of communities and the built environment, such as the level of urbanization, growth rates, and economic vitality, that

contribute to the social vulnerability of places. To date, there has been little research effort focused on comparing the social vulnerability of one place to another. (Cutter, et al 2003, 243)

The eleven variables included in the study accounted for 76% of the variance in social vulnerability around the United States, further supporting previous findings that certain social characteristics lend themselves more to vulnerability. Furthermore, the findings in the study indicate that the social factors contributing to vulnerability varies between counties, “underscoring the interactive nature of social vulnerability—some components increase vulnerability; others moderate the effects” (Cutter, et al 2003, 242).

Cutter (2006) also conducted a study regarding social vulnerability in New Orleans. She found Orleans Parish to be more socially vulnerable than 85% of all other counties/parishes in the United States, and that the parish was equally vulnerable in 2006 as it was in 1960—with race and gender being the most dominant indicators of vulnerability in the city during the entire span of time (Cutter 2006, 10 and 14). She found the Lower Ninth Ward to be a particularly vulnerable space in the city prior to Hurricane Katrina due to the number of structurally unsound homes in the neighborhood and its poverty rate (41 % of all inhabitants) (Cutter 2006, 15).

A number of subsequent post-Katrina studies describe the apparent vulnerability of the African-American community in New Orleans. Seidenberg (2006) found that in New Orleans, people who were socially vulnerable also tended to live in places that were spatially vulnerable and prone to flooding. Bullard and Wright (2009) similarly highlight the relationship between spatial and social vulnerability in New Orleans:

New Orleans’ natural [spatially vulnerable] settings also compounded the economic [social] vulnerability of the black

population... For over 60 years, poor people of color were housed in enclaves that lay almost exclusively in the lower-lying, more flood-prone sections of the city. (Bullard and Wright 2009, 5519)

The literature on vulnerability and hazards highlights the relationship between spatial and social vulnerability and the dominant role that social vulnerability plays during hazard events. Cutter (2000; 2006; Cutter, et al 2003) takes a very comprehensive approach to quantitatively measuring social vulnerability at the local (county/parish) level in the United States, including New Orleans and the Lower Ninth Ward (2006). Bullard and Wright (2009) also devote a considerable amount of their study to examining vulnerability in New Orleans, particularly as it relates to the impact of Hurricane Katrina and how different neighborhoods within the city have recovered. This study will contribute to the literature on vulnerability and hazards by providing an analysis of the Lower Ninth Ward neighborhood, which was prone to hazards long before Hurricane Katrina.

4 Context

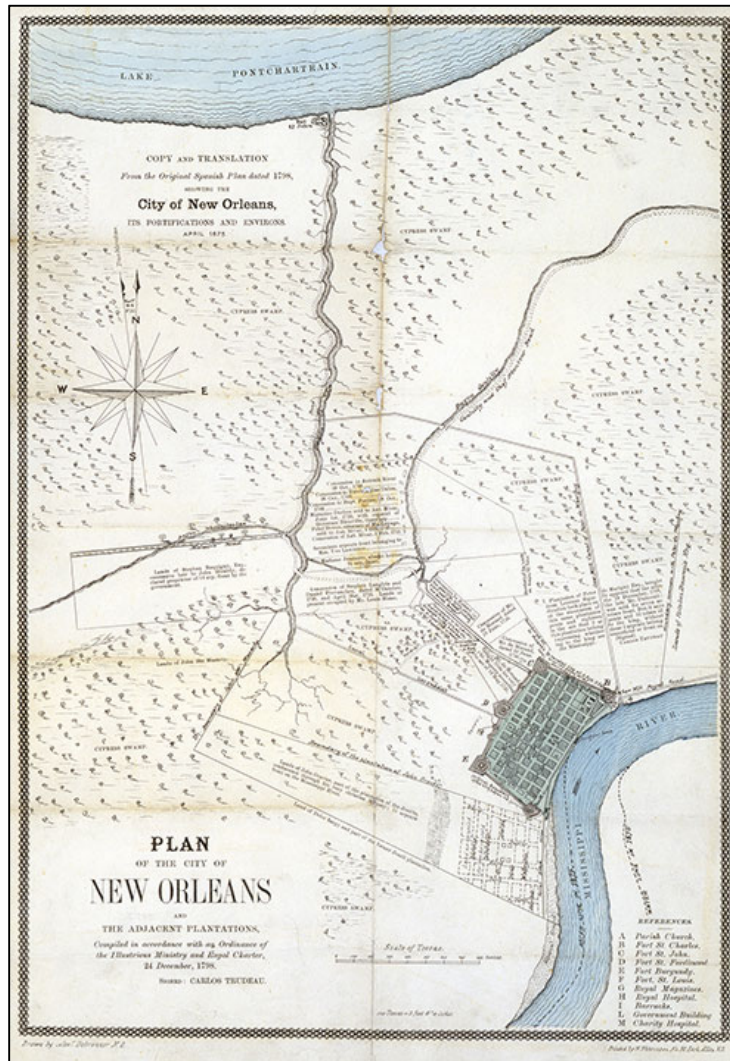
Geographer Pierce Lewis once referred to the city of New Orleans as one that was both “impossible” and “inevitable” due to its proximity to the Mississippi River, Lake Pontchartrain, and the Gulf of Mexico (Lewis 2003, 19). The city’s seemingly “impossible” existence is due to the fact that the “low-lying, flood-prone site selected by the French destined the city of New Orleans to a perpetual struggle with riparian forces. Frequent floods, a wetland site, and the attendant pests and diseases...vexed settlers of the lower river since the city’s inception” (Colton 2000, 4). Even prior to the European colonization of what would become New Orleans in 1718, Native Americans had long begun settling in the area as far back as 2000 BC (Colton 2000, 12).

The city’s seemingly “inevitable” existence can also be traced back to early Native American settlement. In addition to the bountiful natural resources afforded these early settlers by the vast forest and marsh environs of the lower Mississippi River valley, other natural features such as Bayou St. John also made the area quite attractive. Not only did Bayou St. John provide “a natural conduit for drainage from the center of New Orleans... [It also] provided an effective portage between Lake Pontchartrain and the Mississippi River” (Colton 2000, 17). Long before New Orleans even existed as a city, this critical trade route was utilized by Native Americans and was ultimately a catalyst for the inevitability of the existence and strategic importance of what would become New Orleans.

The eighteenth century map of New Orleans (Map 4-1) illustrates how Bayou St. John begins at Lake Pontchartrain and stretches southward toward the historical footprint of New

Orleans (now known as the French Quarter) and the Mississippi River. “Ultimately convinced that the portage between the river and the lake via Bayou St. John was the best strategic location, French authorities began the task of planting a city on the less than hospitable terrain” in the early eighteenth century (Colton 2005, 2). As shipping technology evolved following European settlement, the Bayou St. John route gradually became less relevant. However, the early strategic importance attributed to the waterway by the French proved to be an accurate assessment.

Map 4-1:
 Bayou St. John, 18th Century New Orleans (French Quarter Marigny Historic District 2011)



The same natural features which attracted European settlers to the area also proved to be burdensome, and flooding and drainage were ongoing issues in early New Orleans. Nonetheless,

The Louisiana Purchase in 1803 greatly enhanced New Orleans's role as entrepot to the Mississippi valley. Once the full drainage basin became US territory, trade legally moved downstream to the port near the Gulf of Mexico. With the whole-hearted adoption of steam navigation in the 1820s, New Orleans's position became even more prominent. (Colton 2000, 43)

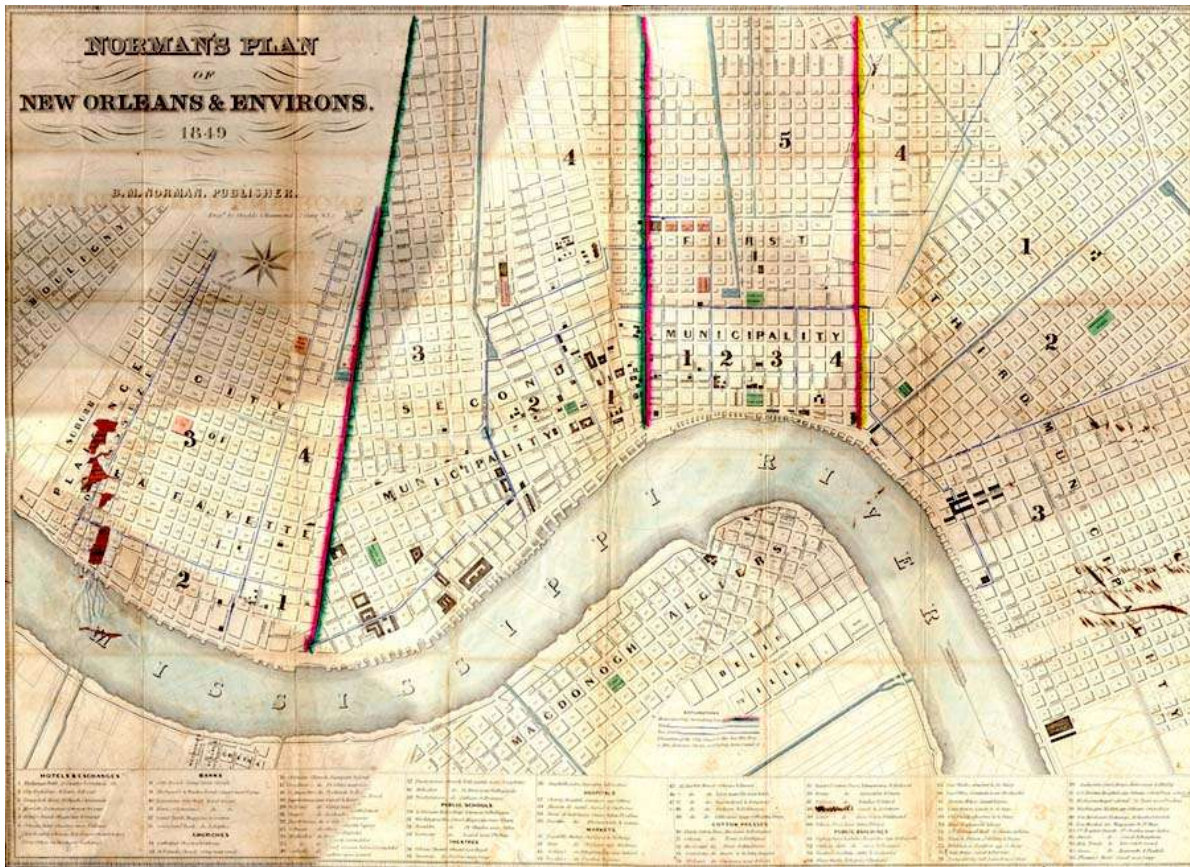
According to the 1810 US Census, New Orleans had already become the fifth largest city in the country (Lewis 2003, 5). The city would enjoy this distinction for most of the period leading up to the Civil War. With the success of the port city came conflict over how the riverfront should be organized and utilized. Such conflicts typically occurred along ethnic and geographic lines, and pitted the newly entrenched Americans against the native Creoles.

4.1 Americanization and the Old and New Basin Canals

After decades of conflict between Americans and Creoles regarding both cultural and economic matters, the city was divided into three separate municipalities along the riverfront in 1836 (Map 4-2). The First Municipality consisted of the historic city grid which was roughly consistent with the footprint of the present-day French Quarter. This area was largely inhabited by native Creoles and was dominated by Creole business interests. The Second Municipality consisted of the Faubourg St. Mary neighborhood, just upriver of the First Municipality in what is now considered to be Uptown New Orleans. Americans whose business interests largely opposed those of the First Municipality Creoles predominantly inhabited this area. The Third Municipality consisted of the area just downriver from the First Municipality, in what are now

considered to be the Faubourg Marigny and Bywater neighborhoods. The Third Municipality was a newer residential area that consisted primarily of Creoles, and was therefore generally aligned with the First Municipality Creoles in their rivalry with the Second Municipality Americans (Kelman 2006, 71).

Map 4-2:
The Three Municipalities of New Orleans, 1849 (Norman 1849)



At the heart of the ongoing dispute between Americans and Creoles in New Orleans was how the riverfront was to be utilized *and by whom*. The Americans insisted that permanent structures should be built along the river in order to accommodate steamships, and that commercial interests along the river should supersede all others (Kelman 2006, 76). Creoles and much of the working-class in New Orleans contended that the erection of permanent structures along the riverfront would be detrimental to the longstanding tradition of public access to the

river (Kelman 2006, 77). The Louisiana Supreme Court in the *Municipality No. 1 v. Municipality No. 2* case ultimately decided this dispute. Judges ruled in favor of the Americans (Municipality No. 2), stating that while the river would continue to be dedicated to public uses, each Municipality in New Orleans had the authority to determine the extent of such uses and to restrict use of the batture (public property along the river) in situations where public use may interfere with commerce (Kelman 2006, 78). Permanent structures were to be allowed for the purpose of commerce despite the historically public nature of the riverfront, setting a precedent for how the riverfront would be utilized for decades to come.

In 1794, the *Old Basin Canal* (or Carondelet Canal) had been constructed as a 1.6-mile extension of Bayou St. John, slightly increasing the reach of the waterway from Lake Pontchartrain toward both the French Quarter and Mississippi River. Shortly thereafter, city leaders began contemplating yet another canal which would extend from the Old Basin Canal and actually connect to the Mississippi River:

In particular, the tract of land which would eventually become Canal Street was once intended to be an actual canal instead of a street. The land was reserved by the US Congress, at the time of the Louisiana Purchase, as a place for the Orleans Navigation Company to dig a canal... The proposed canal was never completed for a very simple reason: water levels of the Mississippi River are not just variable but are also considerably higher than those of Lake Pontchartrain and Bayou St. John...and canal-building technologies of the time had no way to cope with that fact. (Freudenburg, et al 2009, 48 and 49)

In 1830, the Uptown Americans also decided to construct their own separate route from Lake Pontchartrain to the Faubourg St. Mary (subsequently the Second Municipality and later Uptown) riverfront in order to enjoy the same navigational advantages afforded the Creoles by Bayou St. John and the Old Basin Canal. They formed the *New Orleans Canal and Banking Company* in 1831 with \$4 million in capital, and began construction on a six-mile long canal which would connect Lake Pontchartrain to the rear of Faubourg St. Mary (Freudenburg, et al 2009, 49). They subsequently completed construction of the *New Basin Canal* in 1838, “an exact American counterpart” to the Old Basin Canal previously constructed by the Creoles (Lewis 2003, 46). However, the New Basin Canal was actually much wider than the Old Basin Canal and by 1865 had become more utilized and commercially viable than its rival (Freudenburg, et al 2009, 51). Similar to the Old Basin Canal, consideration was given to expanding the New Basin Canal to the Mississippi River in order to connect the river to Lake Pontchartrain, but the plans were again scrapped due to a continuing inability to cope with the water levels of the Mississippi River (Freudenburg, et al 2009, 51).

Following the settlement (albeit temporary) of how the riverfront would be utilized and organized for commerce and the completion of the New Basin Canal, New Orleans thrived as a port. Wharves had been constructed along the river in order to accommodate steamships, and there were now two different canals providing access (although not directly) to the Mississippi River via Lake Pontchartrain. By 1840, New Orleans had become the third largest exporter of goods in the entire world, and the population of the city doubled between 1840 and 1860 (Kelman 2006, 80; Colton 2005, 50).

4.2 Port Competition and Control

While the Civil War certainly impacted New Orleans, by no means was it the lone cause of the city's decline in the middle of the nineteenth century. Technological advances such as new navigation canals and railroads in other parts of the United States began to diminish New Orleans's dominance as a port. Specifically, ports in the Great Lakes region (along with their associated canals) and railroads in cities such as St. Louis and Chicago were highly detrimental to business and development in New Orleans. Going forward, many other railroad-industrial cities such as Minneapolis and Pittsburgh would surpass New Orleans, and by the 1890's the city was only the thirteenth largest in the United States (Lewis 2003, 54). While commerce along the Mississippi River continued to be viable and *central* to the economy in New Orleans, the city had certainly lost its stronghold on the Mississippi River valley.

Railroad lines eventually also made their way into New Orleans, directly encroaching on well-healed riverfront commercial interests and sparking new debates over control of the riverfront. In the interim, port facilities in New Orleans had been declining and it was thought that the city might be in danger of losing some of its most valued customers (Kaufman 1972). Additionally, violent disputes along the riverfront were waged in 1894 between riverfront labor and management regarding wages and other issues (Arnesen 1991). The general consensus was that private interests had long run amok along the supposedly public New Orleans riverfront and that the ensuing chaos surrounding this critical element of the New Orleans economy needed to be brought back under control before all was lost (Dabney 1921).

The aforementioned conflicts and deficiencies along the riverfront culminated in 1896 with the passing of a landmark piece of Louisiana legislation. Act 70 of 1896 established the Board of Commissioners for the Port of New Orleans, an administrative body which would come to be commonly known as the *Dock Board*.

This law, together with later amendments, gave the board authority over all water frontage in Orleans Parish and considerable portions of river and canal frontage in adjacent parishes. Within this area, the board had authority to expropriate private property, to demolish and rebuild structures at will, to operate any facility that it chose, and, at its pleasure, to lease portions of any facility to private operators. (Lewis 2003, 61)

Although the Dock Board was fashioned as a public body, its membership would be drawn from local commercial elites who were deemed “experts” on matters of commerce and trade. The establishment of the Dock Board had the effect of consolidating “control of the waterfront under a body of elite experts, [thereby] diminishing the power of organized labor [and] the railroads” (Kelman 2006, 143). While other commercial interests who felt threatened by the Dock Board’s composition immediately challenged the legitimacy of the Dock Board in court, the Louisiana Supreme Court swiftly upheld the board’s authority.

In terms of the riverfront being reclaimed for public purposes, the composition and actions of the Dock Board were certainly suspect. However, the board’s primary claim to legitimacy as a public body was that it would essentially save the riverfront from the private railroads (Kelman 2006, 145). The Dock Board was successful in doing so, and New Orleans actually obtained its own Public Belt Railroad in 1905. Despite these developments, the longstanding dream of having a navigable waterway connecting Lake Pontchartrain to the Mississippi River was still very much alive.

Bayou Dupre, just south of Lake Borgne and east (downriver) of New Orleans in neighboring St. Bernard Parish, was widened and connected to the Mississippi River in 1904.

Constructed as a private venture, the *Lake Borgne Canal* marked the first successful attempt at connecting the river and lake, and was heralded as a positive step for commerce in New Orleans (Freudenburg, et al 2009, 63). However, the canal was only constructed at forty feet in width (the same width of the Old Basin Canal and twenty feet more narrow than the New Basin Canal), and advances in shipbuilding technology quickly deemed the canal obsolete. The Lake Borgne Canal was eventually abandoned and disconnected from the Mississippi River.

Despite the “natural” advantages in national and international waterborne commerce enjoyed by New Orleans through the middle of the nineteenth century, other port cities around the country eventually gained a competitive edge over New Orleans due to the proliferation of artificial navigation canals and the popularity of rail commerce (Larsen 1977-1978, 117). While New Orleans still maintained a viable port at the turn of the twentieth century and had also established its own Public Belt Railroad, there were other challenges to its continued economic success. Such challenges included a lack of foreign banking institutions and inadequate shipping facilities (Kaufman 1972, 450). These issues became particularly critical after construction began on the Panama Canal (1904), which would connect the Atlantic Ocean to the Pacific Ocean and was expected to create new opportunities for Asian and South American commerce with the Mississippi valley via New Orleans. In terms of the city’s inadequate shipping facilities, the Dock Board was poised (and certainly had the authority) to begin making improvements in preparation for prospective new business, particularly since they were granted the direct authority by the Louisiana Supreme Court in 1912 to act specifically for the “purpose of maintaining and developing...commerce” (Kelman 2006, 152).

The tension between public and private use of the waterfront in New Orleans was an ongoing issue in the city since its inception. The establishment of the Dock Board was thought to

be the resolution to such tensions, given that the board was intended to consolidate authority over the waterfront under a single administrative body that would ensure that the waterfront would be utilized in the best interests of the public. However, the fact that all riverfront property in the city was publicly owned and operated also became a major issue for the Port of New Orleans during the early twentieth century. William Parker explains that:

Because public ownership of the harbor front prevents free play at the water front to private enterprise, auxiliary water frontage (needed) to be created to encourage private capital to invest...(in those industries which require) water front sites where railroads, boats, and ships can be brought into close coordination with production and storage (Parker 1919, 195).

Thomas Ewing Dabney (who was hired by the Dock Board to write about canal-building efforts) also stated that “a number of private enterprises—warehouses and factories—have undoubtedly been kept out of New Orleans because they could not secure water frontage” (Dabney 1921, 6). The shipbuilding industry was thought to have been especially limited due to both a lack of available water frontage and the instability of constructing and berthing ships on the Mississippi River itself.

4.3 Conclusion

In summary, the two major emerging issues for the Port of New Orleans during the early twentieth century were: 1) the loss of its natural competitive advantage due to the proliferation of artificial navigation canals in and around other port cities; and 2) its lack of available water frontage. The proposed solution to these two problems was to improve access to the Mississippi River by constructing yet another navigation canal which would connect the

Mississippi River to Lake Pontchartrain, and to utilize the space on either side of the canal as harbor frontage which could be leased to private enterprises by the Dock Board for a handsome profit (Dabney 1921). The newly created harbor frontage would also serve as an excellent controlled environment in which the shipbuilding industry could thrive. The construction of such a canal would also greatly benefit commercial interests in general by providing them the opportunity to lease property on the canal while also being connected to the traditionally public Mississippi riverfront (Freudenburg, et al 2009, 69).

The construction of the *Inner-Harbor Navigation Canal* (Industrial Canal) would be authorized by the Louisiana state legislature in 1914 for the purpose of accommodating shipping and shipbuilding interests in New Orleans, and ultimately enhancing the city's status as a port. Less than thirty years later, the *Gulf Intracoastal Waterway* would be constructed, connecting the Industrial Canal (and hence, the Mississippi River) to the Gulf of Mexico. Finally, the *Mississippi River Gulf Outlet* would be constructed in the early 1960's, providing an even more direct route between the Industrial Canal and the Gulf of Mexico. While this network of artificial navigation canals provided opportunities for New Orleans to become a seaport in addition to a river port, their impact on the already fragile coastal Louisiana landscape would be highly pronounced for decades to come. Located on the perimeter of the Industrial Canal and in close proximity to where the entire network of canals converged, the Lower Ninth Ward would be especially impacted by these waterways.

5 Methods

The research questions posed in this study are: (1) how has the presence of the Industrial Canal generated environmental risks and affected social outcomes in the Lower Ninth Ward; (2) how have vulnerability and exposure to hazards increased risk to the Lower Ninth Ward over time; and (3) what are the implications of addressing the exacerbation of exposure to natural hazards within the traditional environmental justice framework? In answering the above questions, this study will contribute to the literature on infrastructure projects and risk; isolation, ghettoization and vulnerability; vulnerability and hazards; and race and the environment by providing a retrospective and textured analysis of a neighborhood that has been impacted by a major infrastructure project for nearly one century.

Given the explanatory nature of questions one and two, the case study research design is advantageous in that it allows for an analysis of “operational links needing to be traced over time” (Yin 2003, 6.). The complex nature of describing the relationship between environmental conditions and social outcomes over an extended period of time warrants the use of a variety of data sources, also lending itself to the case study research design. Additionally, the case study research design is appropriate for holistically analyzing the relationship between multiple constructs within a real-life context, as suggested in question two. Finally, given the diversity (both in terms of socioeconomic status and circumstances) of actors within the environmental justice arena and the exploratory nature of question three, the case study research design is an appropriate means of ascertaining the basis and possibilities of an alternative approach to natural hazards within the traditional environmental justice framework.

5.1 Subject Selection

Given the uniqueness of the Industrial Canal and Lower Ninth Ward, a *single-case design* was selected for this study. The Industrial Canal and Lower Ninth Ward were selected for this case study because the canal has existed in proximity to the neighborhood for nearly a century and has impacted the neighborhood in many ways. Specifically, the Industrial Canal has functioned as both a *physical barrier* and a *floodway* to the Lower Ninth Ward, making this area a unique site for research questions one and two. Hurricane Katrina and its impact on the Lower Ninth Ward relative to the presence of the Industrial Canal also make the Industrial Canal and the neighborhood particularly appropriate subjects for this study. Considering that Hurricane Katrina decimated the Lower Ninth Ward population in 2005, the event can be viewed as the culmination of the interplay between risk, vulnerability, and hazards throughout the course of nearly one century in the Lower Ninth Ward. The *longitudinal* nature of this relationship also favors a single-case design and is instructive in terms of how data was collected and organized for this study.

As many scholars have pointed out, the thrust of the environmental justice movement in the African-American community during the 1980's was that the community became engaged in such issues by approaching them within the established civil rights framework (Bullard 1990; Ed. 1993; 1994; Bryant and Mohai eds. 1992; Hurley 1995; Roberts and Toffolon-Weiss 2001; Cole and Foster 2001; Sandler and Pezzullo 2007). Given the history of activism and the role that the Lower Ninth Ward played during the civil rights movement in New Orleans, the Industrial Canal and Lower Ninth Ward make excellent subjects of inquiry regarding the

possibilities of addressing the exacerbation of natural hazards as an environmental justice issue, as proposed in question three.

5.2 Data

One of the strengths of case study research is that it provides for the collection of a wide array of data (Yin 2003; Creswell 2007; 2009). Having the latitude to collect multiple forms of data from various sources was critical to this study, particularly since the scope of the study encompasses a long period of time (roughly 1900-2012). Additionally, the use of such varied forms of data and data sources also provided more opportunities for triangulation, ultimately strengthening the findings and analysis. Table 5.1 shows the breadth of the data used in this study.

The primary data source for this study was the Times-Picayune. Articles were retrieved from *America's Historical Newspapers*, *NewsBank*, and www.nola.com (the official website of the Times-Picayune) using a number of keyword searches for the years 1900 through 2012. Keyword searches ranged from general terms ("Ninth Ward"; "Lower Ninth Ward"; "Industrial Canal," etc.) to terms that were specific to certain events in the neighborhood ("Public School Integration"; "Hurricane Betsy"; "Hurricane Katrina," etc.). Similar keyword searches would subsequently be utilized to retrieve data from other sources. While such keyword searches yielded thousands of related Times-Picayune articles, only approximately 115 articles were deemed as being relevant to this study.

Table 5-1:
Data

| Data Type | Number |
|---|---------------|
| Times-Picayune Articles | 115 |
| Government/University/Non-Profit Reports and Correspondence | 50 |
| Maps, Photos, and Other Images | 42 |
| Scholarly Literature | 22 |
| Other Articles and Web Sources | 12 |

Data pertaining to the Industrial Canal and Lower Ninth Ward was also retrieved from the *Historic New Orleans Collection*. A number of government documents and correspondence, photographs, maps, and other images pertaining to the Industrial Canal and Lower Ninth Ward, were identified on www.hnoc.org (the official website of the Historic New Orleans Collection) and retrieved in hard copy during multiple visits to the archive. Finally, a great deal of data for this study was retrieved from the *City Archives* located in the Louisiana Division of the New Orleans Public Library. Data such as correspondence between public officials and neighborhood associations, public reports and documents, and other official records pertaining to the Industrial Canal and Lower Ninth Ward were identified on www.nutrias.org (the official website of the New Orleans Public Library) and retrieved in hard copy during multiple visits to the archive.

5.3 Data Analysis

Data were analyzed and organized chronologically (and were also divided into *Pre-Katrina* and *Post-Katrina* subsets) and by code (both *a priori* and emerging) (Creswell 2007).

The a priori codes utilized in this study constitute a number of researcher-generated constructs that were established prior to data collection, and are based on the nature of the research questions posed, the existing literature, and personal experience. Emerging codes were identified during the data collection process, and constitute the unexpected constructs that appeared to be independently relevant during data collection process. The constructs used to code data for this study are outlined in Table 5-2.

Table 5-2:
A total of ten codes were used to categorize data during this study

| Code | Type |
|-----------------------------------|-----------------|
| Isolation and Distance | <i>A priori</i> |
| Race and Class | <i>A priori</i> |
| Exposure to Hazards | <i>A priori</i> |
| Neglect and Sabotage | <i>A priori</i> |
| Activism | <i>A priori</i> |
| Suburban/Rural Qualities | <i>A priori</i> |
| Commercial/Elite Control | Emerging |
| Appeals to Justice and Patriotism | Emerging |
| Boosterism/Cause Celebre | Emerging |
| Industrialization | Emerging |

Each set of coded data was analyzed once more and broken into subsections. Upon further analysis of each subsection, the data were consolidated into three overarching themes: *Isolation and Distance*, *Exposure to Hazards*, and *Race and Class*. These three overarching themes permeate virtually all the data collected for the study and provide the greatest insight in terms of answering the proposed research questions. Each of the three themes are also closely

interrelated, allowing for a coherent and highly-textured analysis of the relationship between the Industrial Canal and the Lower Ninth Ward over the past century.

As Table 5-3 Indicates, each of the three themes was initially utilized as a stand-alone code. However, upon analyzing the other coded data subsections it became clear that many of the *a priori* and emerging codes utilized at the onset of the study were virtually inseparable from the *Isolation and Distance*, *Exposure to Hazards*, and *Race and Class* sets of coded data. Consequently, these three constructs began as codes and grew into themes throughout the data collection process.

Table 5-3:
Three primary themes emerged from a number of coded data sets

| <u>Theme</u> | <u>Code</u> |
|--------------------------------------|-----------------------------------|
| <i>Isolation and Distance</i> | Isolation and Distance |
| | Neglect and Sabotage |
| | Activism |
| | Suburban/Rural Qualities |
| | Industrialization |
| <i>Exposure to Hazards</i> | Exposure to Hazards |
| | Neglect and Sabotage |
| | Activism |
| | Appeals to Justice and Patriotism |
| | Boosterism/Cause Celebre |
| <i>Race and Class</i> | Race and Class |
| | Neglect and Sabotage |
| | Activism |
| | Commercial/Elite Control |
| | Boosterism/Cause Celebre |

Findings were discussed in light of the research questions that have been posed, and were also discussed in light of the theoretical perspective of this study and the relevant body of existing empirical research. The contributions of study findings to the relevant body of literature

were also discussed at length. Finally, a number of suggestions were made regarding potential future research on the subject matter addressed in this study.

5.4 Limitations

Environmental and social changes are introduced in this study as very broad concepts, ultimately threatening the validity of the constructs introduced as a means of collecting and measuring data for this study. Additionally, since an abundance of the data collected for this study were derived from media sources, bias also threatens to skew the data collected and to threaten the validity of the constructs used in the study. This is a particularly sensitive issue given the alternate views of life in the Lower Ninth Ward that have been expressed in the media and elsewhere.

In order to address potential limitations relative to construct validity, multiple sources of evidence were used in this study. Environmental and social changes were assessed using both quantitative and qualitative data, balancing demographics against aesthetics and narratives. Media accounts of the Lower Ninth Ward were also supplemented by accounts of the neighborhood by the residents themselves, thereby accounting for media bias and incorporating multiple perspectives into the analysis.

According to Yin (2003), internal validity is a major concern in case study research where causality is being determined. “If the investigator incorrectly concludes that there is a causal relationship between x and y without knowing that some third factor— z —may have actually caused y , the research has failed to deal with some threat to internal validity” (Yin 2003, 36). Given the number of broader societal changes occurring throughout the United States, particularly during the second half of the twentieth century (the civil rights movement; white flight; deindustrialization; suburbanization, etc.), attributing social change in the Lower Ninth

Ward to the presence of the Industrial Canal is problematic. The subjects of this study also present some inherent threats to internal validity. The Industrial Canal is actually part of a *network* of artificial navigation canals in the New Orleans area that as a system has generated risks and fostered vulnerability and exposure to hazards throughout the New Orleans metropolitan area. Consequently, attributing the impacts of events such as hurricanes Betsy and Katrina solely to the presence of the Industrial Canal is also problematic.

The complex nature of the subjects of this study made it impossible to completely eliminate all threats to internal validity, and several inferences were made throughout the course of this study. However, this study focuses on a number of unique, specific events relative to the presence of the Industrial Canal in the Lower Ninth Ward as a means of distinguishing acute instances of environmental and social change from larger societal changes. Rival explanations for environmental and social change in the Lower Ninth Ward were also acknowledged and taken into consideration throughout the course of this study. The unique functional and spatial characteristics of the Industrial Canal as part of the larger network of navigation canals in New Orleans is also highlighted and explained in the study as a means of distinguishing its impacts from those of other artificial waterways in the network.

While the unique functional and spatial characteristics of the Industrial Canal and Lower Ninth Ward create opportunities for the internal validity of this study, they do generate some concerns in terms of external validity. The unique relationship between the Industrial Canal and Lower Ninth Ward is interesting, making them attractive subjects for this study. Furthermore, the attention that the Lower Ninth Ward has garnered in popular culture since Hurricane Katrina has made the plight of the neighborhood interesting to observers outside of

academia. But on the surface it appears as though any findings relative to the Industrial Canal and Lower Ninth Ward may have limited generalizability.

In order to address threats to external validity in this study, the findings and analysis have been tied to larger questions regarding risk, vulnerability, hazards, and environmental justice. While the subjects of the study are in fact unique, the findings contribute to the larger body of research and may be applicable elsewhere. This is particularly true of that portion of the study that addresses environmental justice—a broad spectrum of similarly situated subjects may be identified for further research once the logical basis for addressing natural hazards within the environmental justice framework is firmly established.

The reliability of this study was established by following a very basic, standard set of case study design procedures. Data collected for the study was indexed both topically and chronologically using a very straightforward analysis and coding process. Finally, the findings and analysis of the study were presented in three concise topical chapters for the purpose of making the study more coherent despite the extended time frame covered in the study.

6 Isolation and Vulnerability

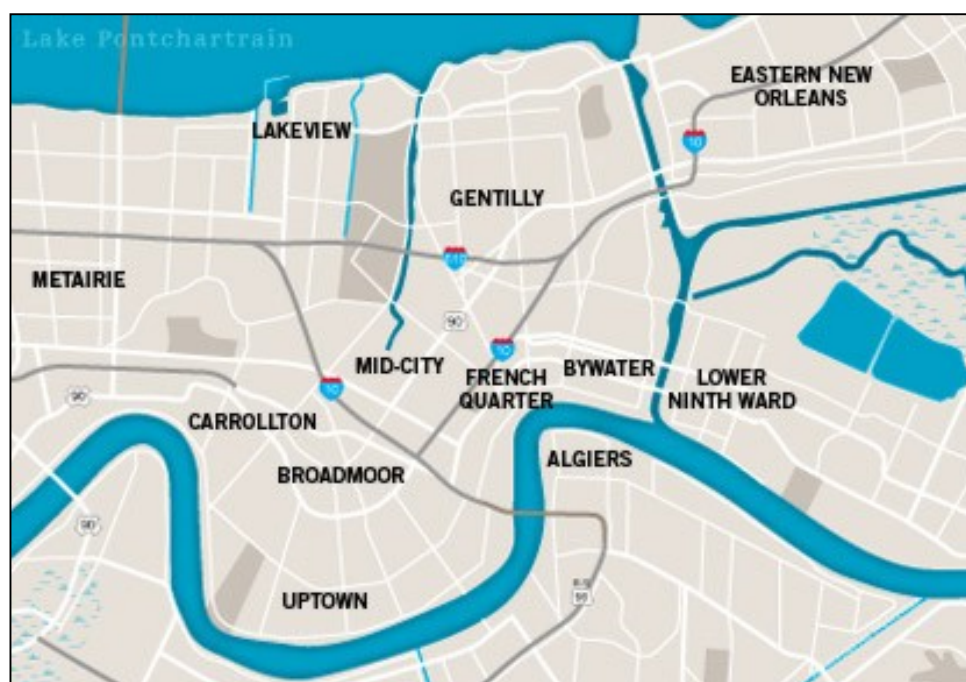
The geographic isolation of the Lower Ninth Ward is the neighborhood's most dominant feature. In fact, the existence of the Lower Ninth Ward as a distinct neighborhood in New Orleans is due solely to the presence of the Industrial Canal, which severed the neighborhood from the larger Ninth Ward area. The area originally designated as the Ninth Ward in 1852 was bisected by the construction of the Industrial Canal, and the eastern (or downriver) side of the canal became the Lower Ninth Ward (Landphair 2007). The boundaries of the Lower Ninth Ward include the Industrial Canal (west); the Mississippi River (south); Bayou Bienvenue and the Mississippi River Gulf Outlet (north); and the Jackson Barracks military base and St. Bernard Parish line (east) (see Map 6-1). More importantly, the Lower Ninth Ward is isolated from the rest of New Orleans by the Industrial Canal, and residents must cross one of three drawbridges in order to access other parts of the city.

The construction of the Industrial Canal and subsequent navigable waterways contributed to the growth of the Lower Ninth Ward during the first half of the twentieth century. However, isolation in the Lower Ninth Ward intensified during this period and the neighborhood frequently experienced lapses in the provision of municipal services. The neighborhood became increasingly vulnerable during the decades leading up to Hurricane Betsy, and social conditions in the neighborhood began to sharply decline in the 1960's. The Lower Ninth Ward was especially vulnerable when Hurricane Katrina struck. Consequently, the population fell to a lower level than it had been prior to the construction of the Industrial Canal.

Despite the challenges associated with the isolated location of the Lower Ninth Ward, there were historical strengths. The Lower Ninth Ward grew as an independent, tight-knit neighborhood that valued its high rate of homeownership and other suburban qualities.

Additionally, lapses in the provision of municipal services in the Lower Ninth Ward cultivated a tradition of activism in the neighborhood and strengthened residents' bonds to one another and to the neighborhood itself (Landphair 1999; 2007; Giancarlo 2011). Following Hurricane Katrina, the Lower Ninth Ward garnered a considerable amount of national attention. Although much of the attention perpetuated many stereotypes and focused on the devastating impacts of Hurricane Katrina, the Lower Ninth Ward has begun to experience a considerable amount of reinvestment in infrastructure (particularly hurricane protection) and a slight uptick in available housing and amenities.

Map 6-1:
The Industrial Canal and Lower Ninth Ward (National Public Radio 2011)



6.1 The Industrial Canal and Early Development (1900-1940)

In 1914, the Louisiana state legislature authorized the Dock Board to construct a relatively small barge canal connecting Lake Pontchartrain to the Mississippi River. Considered by many canal boosters as somewhat of a rural backwater, the Ninth Ward neighborhood was

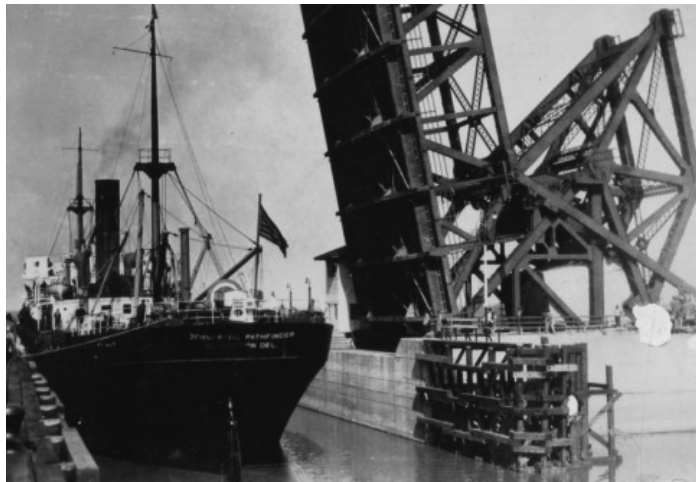
selected by the Dock Board and approved by the Louisiana state legislature as the site for the construction of the Industrial Canal (Dabney 1921). Prior to the construction of the Industrial Canal, the Dock Board's opinion of the Ninth Ward was that although there were a few houses "helter-skeltered about like blocks in a nursery," the area was virtually uninhabited and that, "the principal signs of human life [in the area] were the cows that grazed..." (Dabney 1921, 16 and 18) An early twentieth century tourism brochure for the city of New Orleans also said of the Ninth Ward "there was sections... which have never been visited by man" (Landphair 2007, 839). However, the reality was that as of 1910, over 7% of the city's population (25,599 people) resided in the Ninth Ward area (Landphair 2007, 839). The street grid in what would later become the Lower Ninth Ward was also in place as of 1909 and the neighborhood already included many residences, churches and businesses (Sanborn Maps 1909).

Data collected from the earliest days of the Industrial Canal and Lower Ninth Ward suggest that the isolating effect of the Industrial Canal would have on the neighborhood was understood by decision makers before construction of the canal began (construction began in 1918 and was completed in 1923). The Times-Picayune references an Industrial Canal Committee meeting that was conducted in 1916 for the purpose of discussing "plans for the industrial canal to bisect the city" (Industrial Canal Work 1916). The impact that the Industrial Canal would have on development in New Orleans also seems to have been widely understood by decision makers prior to construction of the canal. The term "lower" was first used to describe the area east of the Industrial Canal in the following 1918 headline: "Great Industrial Canal Puts Lower Part of City in the Limelight" (Third District Property 1918). The same article also refers to the area as the "lower Third District" and stresses the importance of "development of all land near the canal" (Third District Property 1918).

The Industrial Canal would soon become a permanent fixture in the New Orleans landscape. After several changes were made to the original design of the canal, the final product was a modern shipping channel accompanied by what was at the time one of the largest docks in the United States (Freudenburg, et al 2009, 70). Maps from the period immediately following construction of the Industrial Canal illustrate the degree to which the “lower” part of the city had been severed from the rest of New Orleans (Taylor 1924). Initially, the St. Claude Avenue Bridge (a drawbridge crossing the Industrial Canal at St. Claude Avenue) was the only connection between the Lower Ninth Ward and the rest of New Orleans.

Figure 6-1:

The St. Claude Avenue Bridge was the first and only bridge open for traffic across the Industrial Canal until the late 1930's (State Library of Louisiana 1930)



The very presence of the Industrial Canal necessitated that residents of the Lower Ninth Ward and neighboring St. Bernard Parish be dependent on drawbridges in order to travel into New Orleans. Drawbridges traversing the Industrial Canal are frequently raised so that marine vessels travelling to and from the Mississippi River can pass. The slow-moving vessels often cause significant delays in traffic. Not only have the drawbridges encouraged further development in the Lower Ninth Ward, but they have also functioned as barriers between the neighborhood and the city—as development in the Lower Ninth Ward increased, so did the

number of people who would be adversely impacted by delays relative to the presence of the drawbridges. The construction of the Industrial Canal sparked new development in the neighborhood, contributing to a 64% increase in its population between 1920 and 1940 (Landphair 2007). New jobs and affordable housing opportunities made the Lower Ninth Ward neighborhood an attractive place for working-class families to settle in New Orleans, and most new development during this period occurred north of St. Claude Avenue toward Claiborne Avenue (New Orleans City Planning Commission 1976).

Drawbridges traversing the Industrial Canal inevitably became a source of isolation and distress for both the Lower Ninth Ward and St. Bernard Parish, and were a contested political topic before construction of the canal was even completed. St. Bernard Parish Sheriff Albert Estopinal warned in 1918 that communities east of the Industrial Canal would essentially be cut-off from the city of New Orleans in the event of a bridge malfunction at St. Claude Avenue (St. Bernard News 1918). However, a second crossing would not be constructed until the late 1930's.

The isolating effect of the Industrial Canal also impacted the provision of public services in the Lower Ninth Ward. Businesses in St. Bernard Parish (also isolated from the city by the Industrial Canal) complained about city streetcar services not long after construction of the canal began, claiming that they were already “having a hard time keeping their employees” (Complaints Against 1918). “It is easy for them to secure employment nearer to their homes and thus escape all the annoyances and inconveniences” associated with crossing the canal (Complaints Against 1918). Lower Ninth Ward residents later made similar complaints, declaring that streetcar and bus services to their neighborhood were “inadequate, inefficient, and the cause of a considerable loss of time by residents of that part of New Orleans” (Council Invited 1927).

In terms of public facilities and infrastructure, the data suggest that the Lower Ninth Ward was often behind the rest of the city. Residents were forced to petition the Orleans Parish School Board for a new school in the neighborhood in 1920 and did not have any public youth recreational facilities until 1927 (Residents Ninth Ward 1920; New Play 1927). The City of New Orleans was also slow to provide the Lower Ninth Ward with basic infrastructure such as road lighting, sewerage systems, and adequate drainage. When a new lighting system was installed on St. Claude Avenue in 1936, the new apparatus did not extend across the canal into the Lower Ninth Ward. “Extension of the St. Claude Avenue lighting system to the thoroughfare below the Industrial Canal, and other improvements for that area, were requested by a delegation of Ninth Ward residents” in 1936 (Lighting System 1936).

The presence of the Industrial Canal would also raise a number of questions regarding political representation and the provision of public services in the Lower Ninth Ward. Members of the St. Bernard Parish Police Jury would suggest in 1919 that St. Bernard Parish annex “that part of the Ninth Ward of New Orleans below the industrial canal” for the sake of consolidating political representation and public services east of the canal (St. Bernard Seeks 1919). Although this movement did not gain any traction, this would be the first of three attempts to use the Industrial Canal as a political boundary to distinguish the Lower Ninth Ward.

After nearly two decades of only having a single bridge crossing the Industrial Canal, State WPA Administrator James Crutcher and New Orleans Mayor Robert Maestri finally acknowledged the need for an additional bridge (Lighting System 1936; Florida Avenue Bridge 1937). A roadway was subsequently added to the previously railway-only Florida Avenue drawbridge. A third and final drawbridge at Claiborne Avenue would not be constructed until the 1950’s.

The Industrial Canal was initially a commercial success, as more than fifty businesses quickly lined the banks of the new harbor between the Mississippi River and Lake Pontchartrain (Freudenburg, et al 2009, 70). As predicted by the Dock Board prior to the completion of the Industrial Canal, there would be an opportunity for the canal to be connected to the Gulf Intracoastal Waterway (GIWW) system. “The Board became convinced that the Industrial Canal should be considered the first step toward a canal to the sea,” wrote Dabney in his description of the Industrial Canal and its purposes (Dabney 1921, 19). The significance of the effort to connect the Industrial Canal to the GIWW system was that doing so would provide for a more direct route from the Gulf of Mexico to the Mississippi River at New Orleans.

The construction of the Industrial Canal had major implications in terms of commerce and development in the Lower Ninth Ward. As the Dock Board expected, a number of businesses were attracted to the new harbor frontage along the Industrial Canal, and with that came jobs and development in the Lower Ninth Ward. Isolation and lapses in public services clearly became issues for Lower Ninth Ward residents as soon as construction of the Industrial Canal began, and the intensification of development in the area only exacerbated problems. Nonetheless, development along the Industrial Canal would continue as the Dock Board attempted to turn the thriving river port in New Orleans into a seaport as well. Throughout the “seaway movement” in New Orleans, the Lower Ninth Ward would continue to develop on the eastern banks of the Industrial Canal.

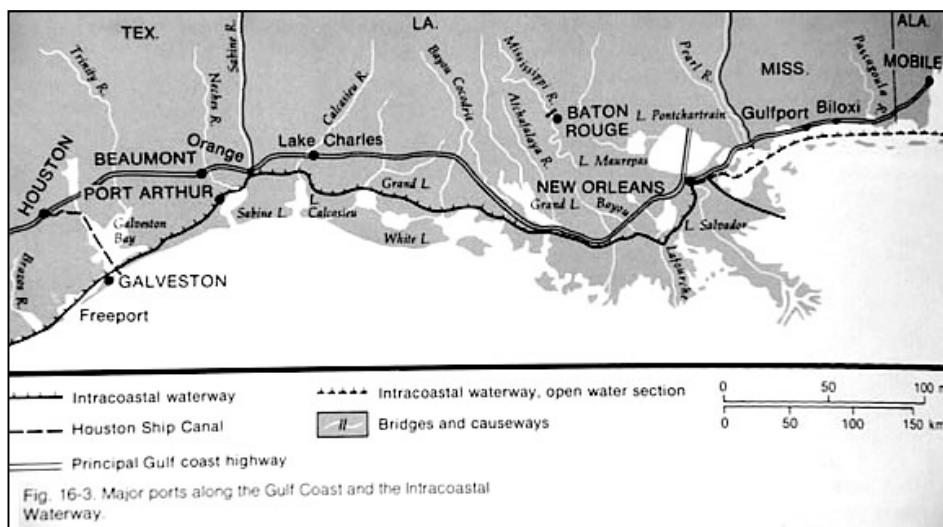
Although early accounts of the Lower Ninth Ward highlight the marginal status of the area (in terms of political and economic assets) prior to the construction of the Industrial Canal and the isolation it experienced thereafter, other accounts describe an independent, tight-knit neighborhood that represented promise and opportunity for the working-class. Benevolent and

mutual-aid societies were established in the Lower Ninth Ward from its earliest days, and the rural atmosphere in the neighborhood was appealing to many inhabitants (Landphair 1999; 2007). The availability of cheap land also attracted a working-class population seeking homeownership opportunities. Residents interviewed by Giancarlo (2011) indicated that their families originally settled in the Lower Ninth Ward in order to become homeowners and to “live the American dream” (122). The independent spirit and attachment to place associated with early Lower Ninth Ward settlement would continue throughout the neighborhood’s existence.

6.2 The New Orleans Seaway Movement (1940-1965)

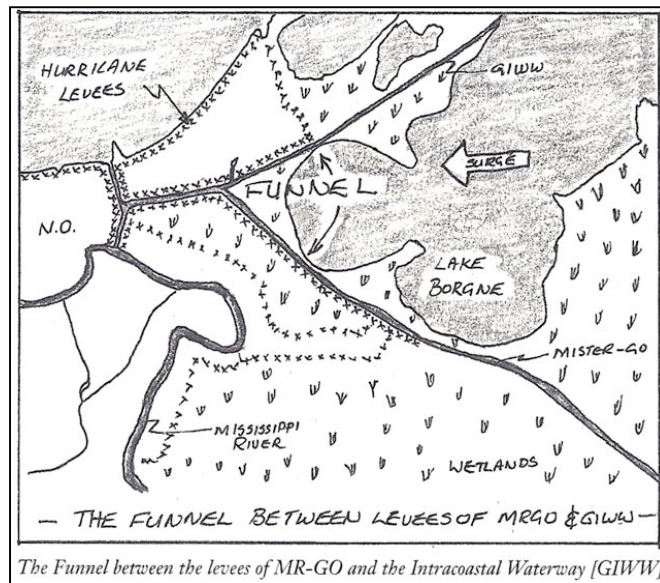
The GIWW system is a network of canals that allows ships to transport goods along the central Gulf Coast while remaining inside the coastline and/or on the interior of barrier islands. The United States Congress authorized the extension of the GIWW to the Industrial Canal in 1942, bringing New Orleans closer to becoming a seaport. As Map 6-2 indicates, the GIWW (referred to on the map simply as the “Intracoastal waterway”) now extends across all of southern Louisiana and into Texas. The entire length (not pictured) of the Intracoastal Waterway system extends from Boston, Massachusetts to Brownsville, Texas near the border of Mexico.

Map 6-2:
The Gulf Intracoastal Waterway System (GIWW) (Northern Arizona University 2011)



As seen in Map 6-3, the GIWW enters New Orleans through the northern portion of Lake Borgne and intersects the Industrial Canal roughly halfway between the Mississippi River and Lake Pontchartrain.

Map 6-3:
The GIWW/Industrial Canal Intersection (Levees Not War 2011)



The stretch of the GIWW that spans the northern portion of Lake Borgne was problematic from the onset.

It was narrow, and obviously it was limited to vessels of less than a nine-foot draft. In addition, channels across shallow bays and estuaries are notoriously difficult to maintain, because the wave and current action contribute to rapid siltation. The correction of this problematic portion of the GIWW would play an eventual role in the excavation of an even larger navigation project.

(Freudenburg, et al 2009, 71)

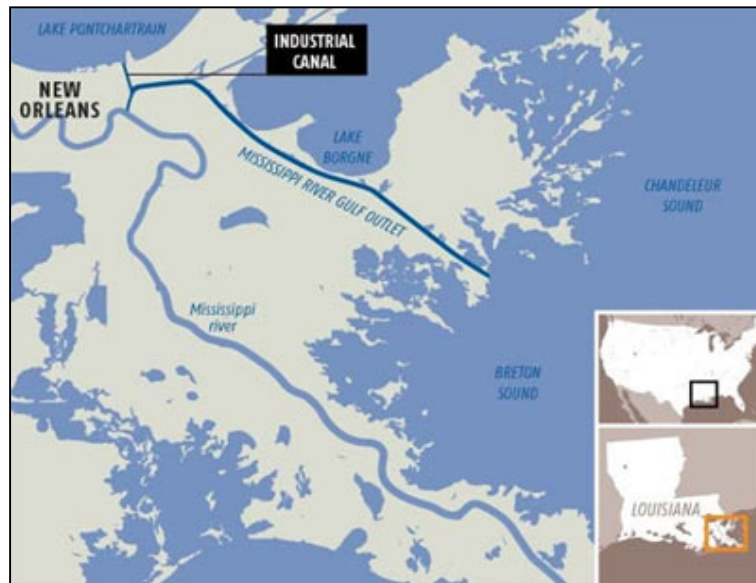
The GIWW was clearly not going to satisfy the Dock Board's desire for New Orleans to become a seaport, and it was going to become necessary for an additional navigation canal to be constructed in order to make the seaport vision a reality.

By early 1943, business interests in New Orleans and the Louisiana state legislature had already lobbied the United States Congress to consider constructing a new canal that would provide a more direct route from the Gulf of Mexico to the Mississippi River. They argued that such a project would not only be good for commerce, but would also serve national security interests by providing an alternative route in the event that the river was closed due to an act of war. Congress ordered a study of the viability of the project in 1943, and by 1948 the project had been endorsed by the Chief Engineer of the Army (Freudenburg, et al 2009, 78).

Despite calls for the construction of yet another navigation canal, the Port of New Orleans was already thriving during this period. In 1947, the port ranked second in the United States in dollar value of trade and fourth in tonnage (Haas 1974, 65). Additionally, by 1948 the Dock Board had completed construction of new port facilities that included modern wharves and sheds, as well as a public grain elevator and cotton warehouse (Haas 1974, 65). Nonetheless, the pursuit of a new navigation canal continued, and by 1956 Congress had authorized the construction of the *Mississippi River Gulf Outlet* (MRGO). The MRGO would eventually cost a total of \$580 million (much higher than initially anticipated), and would provide deep draft vessels with a 75-mile route (45 miles shorter than entering the river at its mouth) to the Mississippi River via the Industrial Canal (Freudenburg, et al 2009, 84). Construction of the MRGO began in 1957 and the interim canal was completed in 1963. The MRGO was 100% complete and at full capacity by 1968. As Map 6-4 indicates, the MRGO converges with the

GIWW in eastern New Orleans and flows into the Industrial Canal, where ships can then access the Mississippi River through the canal locks.

Map 6-4:
The Mississippi River Gulf Outlet (US Army Corps of Engineers 2011)



The Industrial Canal was the initial piece of what quickly became a network of artificial navigation canals that surrounded the Lower Ninth Ward. As Map 6-5 indicates, the Industrial Canal borders the LNW to the west and severs the community from the city of New Orleans; the GIWW runs north of the neighborhood; and the MRGO runs north-northeast of the Lower Ninth Ward, converging with the GIWW. Completing the “island effect” in the Lower Ninth Ward is the Mississippi River, which runs to the south of the entire neighborhood. Despite being on an island surrounded on three sides by artificial waterways, the Lower Ninth Ward continued to develop during most of the seaway movement time period.

Map 6-5:
The Lower Ninth Ward and Surrounding Waterways (New York Times 2009)



By 1950, the Times-Picayune described the Industrial Canal as running through “a major industrial area” of the city, although the paper often neglected to acknowledge the significant residential development that had been occurring in the Lower Ninth Ward (In Greater 1950). Finally, the Times-Picayune would later note that “the growing list of industries along the Industrial Canal creates new employers and new payrolls and jobs...but those who live and work below the waterway always had headaches crossing it” (Welcome N. Claiborne 1957). A 1957 letter from the *Ninth Ward Civic and Improvement League* to Mayor Chep Morrison highlighted the residential population growth in the Lower Ninth Ward and pointed out the need for public

improvements in the area (Luke 1957, November). The organization also states in the letter that “it seems that we have been excluded from the city’s planning program” (Luke 1957, November).

An additional Industrial Canal crossing at Claiborne Avenue was proposed in the early 1950’s. However, there was disagreement as to whether a drawbridge or tunnel would be constructed. While the Dock Board supported a tunnel, which would cause the least amount of disruption to commercial navigation in the canal, Mayor Chep Morrison and State Senator William Seeber both supported the use of a drawbridge. According to Senator Seeber, a drawbridge “would be more economical and would allow some of the money to go for other purposes” (St. Claude Avenue Bridge Committee 1953).

It was decided that a third drawbridge (rather than a tunnel) would be built across the Industrial Canal at Claiborne Avenue in the Lower Ninth Ward. The bridge (which would later be named in honor of Seeber) was completed in 1957 and would become yet another source of frustration for Lower Ninth Ward and St. Bernard Parish motorists and pedestrians seeking to get to and from New Orleans. Leading up to 1965, the Lower Ninth Ward had experienced a great deal of growth, particularly along the commercial and industrial corridor that ran along the canal between Claiborne Avenue and Florida Avenue (Dyson 2006, 11).

The drawbridges crossing the Industrial Canal increasingly became a nuisance for both residents and industry. When the St. Claude Avenue Bridge was closed to marine vessel traffic and remained in the down position for a brief period of time in 1953, the Times-Picayune acknowledged the problems that residents were having with the drawbridges: “Motorists who cross the St. Claude bridge everyday were in for a treat recently. For nearly a week they didn’t have to worry about the bridge going up for vessels...” (Jackson 1953).

Controversy over whether the bridges would be closed to marine vessel traffic during peak vehicular traffic hours each weekday would also soon surface. Commercial interests were against limiting when the bridge would be drawn for ships to pass: “By closing the bridge this will severely injure everyone located on the Industrial Canal on the New Orleans side” (Calmes Engineering Co. 1955). Conversely, the City of New Orleans supported closing the bridges to canal traffic in order to accommodate vehicular and pedestrian traffic to and from the Lower Ninth Ward. “The proposed opening of the bridge during peak hours would be detrimental to vehicular traffic movement...such openings would cause irreparable delay to vehicles and passengers” (Ristroph 1957). Even St. Bernard Parish Police Jury President Eugene Estopinal became part of the debate regarding the bridge crossings at the Industrial Canal, claiming, “the parish had always been adversely affected by the canal [and that] the bridge and canal continue to hold down the parish’s growth” (St. Claude Bridge 1957).

Many Lower Ninth Ward residents remained critical of the provision of municipal services in the neighborhood during this period. Between 1940 and 1960, neighborhood residents insisted that crime and blight in the Lower Ninth Ward could be attributed to the indifference of city officials toward the neighborhood and that “rarely seen police officers...seemed more intent on hassling law-abiding citizens than on pursuing real criminals” (Landphair 2007, 843). It was not until 1954 that residents of the Lower Ninth Ward were promised a “sanitary sewerage system” similar to what most of the city already had (Sewerage Soon 1954). By the mid-1950’s Lower Ninth Ward residents were expressing concerns about a wide range of public services and living conditions, including poor drainage, overcrowded schools, litter, and “disease-breeding septic tanks” (Sewerage Soon 1954). The Lower Ninth Ward neighborhood began to capture the attention of at least some local residents according to a 1959 survey which concluded that, “to

denote someone as living ‘out in the Ninth Ward’ has certain overtones of remoteness and distance” (Bureau of Governmental Research 1996).

Outside reports often portrayed the Lower Ninth Ward in a monolithic fashion, neglecting to mention important neighborhood characteristics and strengths. One reporter described the Lower Ninth Ward during this period as an area that “looks like the wrong side of the tracks in any small rural southern town” despite the fact that it was actually part of one of the largest cities in the South as of 1960 (Germany 2007, 68). The appearance of the neighborhood was allegedly then characterized by “dirt roads, ramshackle homes, cement block buildings, abandoned automobiles, and overgrown vacant lots” (Germany and Johnson 2005, 235 and 236). Additionally, the Lower Ninth Ward was

Comprised of 414 city blocks, [it] had no hospitals, public clinics, library branches, bank branches, high schools, police stations, pawnshops, or department stores. Public recreation space consisted of only three acres...Eleven blocks had over 67 percent blight. Over five hundred buildings were designated as dilapidated and over eight hundred as deteriorating. (Germany 2007, 68 and 69)

Although many neighborhoods in New Orleans had nearby public swimming pools, the Lower Ninth Ward still did not have one in their area as of 1961. The Ninth Ward Civic and Improvement League wrote a letter to Mayor Chep Morrison in 1961 to inform him that “summer is here again and the children of the Lower Ninth Ward are swimming in the canal because they do not have a swimming pool” (Luke 1961). By the early 1960’s, the Lower Ninth Ward had already been distinguished as a community isolated from New Orleans by an industrial

corridor and waterway, and residents had become sensitized to the challenges associated with the neighborhood's geographic disposition.

Figure 6-2:

An aerial photograph taken in 1960 provides a snapshot of how the Industrial Canal had severed the Lower Ninth Ward from New Orleans (New Orleans Public Library 1960)



In spite of the challenges, the Lower Ninth Ward experienced a tremendous amount of growth for much of the seaway movement period (the population peaked at 33,000 in 1960 and then started to decline) (Campanella 2009). Use of the Industrial Canal intensified as the GIWW and MRGO were constructed, and the Claiborne Avenue Bridge facilitated additional residential growth in the northern reaches of the Lower Ninth Ward (New Orleans City Planning Commission 1954). However, the growing Lower Ninth Ward population also became increasingly isolated and frustrated by many quality of life issues in the neighborhood relative to lapses in the provision of municipal services. Various social movements (including public school integration, suburbanization, and white flight) and Hurricane Betsy would drastically alter the trajectory of the Lower Ninth Ward during the preceding time period.

While the data pertaining to the seaway movement era in the Lower Ninth Ward largely describes the intensification of isolation and lapses in the provision of municipal services, the

neighborhood residents cultivated a tradition of activism that would prove useful during the civil rights movement and beyond. The role that the Lower Ninth Ward played in the integration of New Orleans public schools in 1960 (discussed in greater detail in Chapter 8) would lay the groundwork for neighborhood activism following hurricanes Betsy and Katrina, and may be instructive in terms of the how the neighborhood might address natural hazards going forward.

6.3 Post-Betsy, Pre-Katrina (1965-2005)

Hurricane Betsy flooded 164,000 homes in New Orleans, including 80% of homes in the Lower Ninth Ward (Dyson 2006, 11). The hurricane was at that time the most costly (\$1 billion) natural disaster in United States history, earning the storm the nickname “Billion Dollar Betsy.” A total of 76 people perished in New Orleans during the event, many of which were in the Lower Ninth Ward. Levees along the eastern banks of the Industrial Canal failed during the event, and some parts of the Lower Ninth Ward were subjected to over ten feet of floodwater. By 1966 there was still storm debris scattered across parts of the neighborhood (Germany 2007, 75). For the remainder of that year, the neighborhood would have to organize and aggressively petition their local elected officials to provide more assistance with cleanup efforts. The neighborhood had been completely devastated, yet the city was slow to provide the assistance it needed to recover.

Figure 6-3:
Hurricane Betsy Flooding near the Claiborne Bridge, Lower Ninth Ward (Superstock 2011)



Figure 6-4:
Hurricane Betsy Flooding on Flood St., Lower Ninth Ward (Glogster EDU 2011)



The devastation wrought by Hurricane Betsy and the subsequent sluggish recovery further exacerbated the disinvestment and white flight the Lower Ninth Ward. Between 1960 and 1970, over 77% of the white population had left the Lower Ninth Ward and by 1970 23% of remaining residents were living in poverty (Landphair 1999, 62 and Landphair 2007, 842). This trend would continue during the decades leading to Hurricane Katrina, at which time 36% of Lower Ninth Ward residents lived in poverty, nearly double the statewide rate (Dyson 2006).

Following Hurricane Betsy and the various social movements of the 1960's, city officials began paying more attention to lapses in public services in the Lower Ninth Ward. A report drafted by the New Orleans City Planning Commission found that as of 1967, 40% of Lower Ninth Ward streets were in need of repair and 80% of the streets lacked subsurface drainage (1967, 102). Other nearby neighborhoods on the other side of the Industrial Canal, such as Bywater (5% of streets in need of repair and 35% of streets lacking subsurface drainage) fared much better in the planning commission's assessment of city infrastructure (New Orleans City Planning Commission 1967, 83-84).

The significant loss of life and property in the Lower Ninth Ward during Hurricane Betsy also drew attention to the neighborhood's level of hurricane protection. Following a "near miss" in the Lower Ninth Ward during Hurricane Camille (1969), State Representative Elmer Tapper criticized the Orleans Levee Board, publicly accusing that agency of neglecting the Lower Ninth Ward and acting as though their responsibility for providing flood protection ended at the Industrial Canal (Orleans Levee 1969). A resident wrote in a Times-Picayune editorial that "the residents of the 9th Ward will always live in fear of rising water whenever any type of storm approaches the area...the Ninth Ward residents are the 'step-children' of the city" (Magee and Roberts 1969).

Descriptions of the Lower Ninth Ward throughout the 1960's were frequently prefaced with an explanation of its geographic location east of the Industrial Canal (9th Ward Area 1966; 9th Ward Plans 1966; Urban Renewal 1967; Plans for City 1968; Urban Renewal Possible 1969). Following Hurricane Betsy, the isolation of the Lower Ninth Ward was intensified by the hurricane protection system erected along the banks of the Industrial Canal. Construction of a floodwall along the Industrial Canal began in the late 1960's and continued into the 1970's: "The

wall is being placed atop steel sheet piling installed earlier in the east bank Inner-Harbor Navigation Canal levee... the 'I' wall is being built up to five feet above the mean sea level” (Sossaman 1969; Lower 9th Ward 1970).

While the construction of the Industrial Canal floodwall reinforced the spatial isolation of the Lower Ninth Ward, several factors contributed to the intensification of social isolation in the neighborhood. Some journalists attributed white flight in the Lower Ninth Ward to poor quality housing and other environmental hazards following Hurricane Betsy, stating that such conditions “effectively concentrated the poor, minorities and multi-problem families in uniform, sometimes sanitized ghettos...” (White Exodus 1971). Plans to widen the Industrial Canal locks for the purpose of allowing the canal to accommodate larger ships also created a great deal of uncertainty for residents of the Lower Ninth Ward. Planner Sam Bell warned “it was difficult to make plans for development of the Lower Ninth Ward with the uncertainty of a canal through the area” (Channel Lock Plan 1973). Nonetheless, the neighborhood would be threatened with the canal-widening project and the prospect of hundreds of Lower Ninth Ward properties being expropriated for decades to come. In 1974, Louisiana State Representative A. Charles Borello introduced a bill that would create an entirely new parish east of the Industrial Canal. He stated that he was introducing the legislation “at the request of dissatisfied residents” (Gillis 1974). This legislation marked the second effort to separate the Lower Ninth Ward from the city of New Orleans during the twentieth century.

Hurricane protection and social conditions in the Lower Ninth Ward garnered considerable attention from public officials and the local media in the 1960’s and into the 1970’s. During the 1970’s, the New Orleans Department of Policy and Planning conducted a number of

studies (including surveys) regarding social conditions throughout New Orleans. The agency identified a number of deficiencies in the Lower Ninth Ward, as indicated in Table 6-1.

Table 6-1:
New Orleans Department of Policy and Planning Lower Ninth Ward findings during the 1970's (Office of Policy and Planning 1979)

| Year | Subject | Findings |
|-------------|----------------|--|
| 1975 | Recreation | Severe lack of recreational opportunities |
| 1979 | Public Safety | 88% of survey respondents expressed need for increased police patrol |
| 1979 | Blight | >50% of survey respondents complained about high grass and litter |
| 1979 | Recreation | Playgrounds have deteriorated due to vandalism and neglect |
| 1979 | Recreation | Regional recreational facilities not easily accessible |
| 1979 | Healthcare | Services need to be improved |
| 1979 | Daycare | Services need to be improved |
| 1979 | Transportation | Only 2 bus lines cross the canal; 39.93% of households have no transportation |
| 1979 | Recreation | Because of geographic isolation, parks and playgrounds are necessary and vital |

The New Orleans Department of Policy and Planning consistently pointed to the geographic isolation of the Lower Ninth Ward as the cause of many of the neighborhood's social ills:

Even as the neighborhood became more and more settled isolation from the rest of the city became a problem... Although there are three crossings of the Industrial Canal today isolation continues to be a problem... The physical isolation of the Lower Ninth Ward from the rest of the city necessitates that the neighborhood and its residents become more self-sustaining... Geography has been and continues to be the predominant factor in the development of the Lower Ninth Ward. This area was still considered a backwater

swamp when other neighborhoods in the ninth ward were firmly established... As a relatively isolated area this neighborhood constitutes a ready market for both retail sales and consumer services (Office of Policy and Planning 1979).

Although it was noted that access to healthcare was an issue in the Lower Ninth Ward during the 1970's, the only public health clinic in the Lower Ninth Ward closed in 1980. The Times-Picayune covered the closure and characterized the neighborhood as "at best an isolated community, far away from the hub of urban activity..." (Lovell 1980). They reported that there was not a single private family medical practice in the neighborhood when the health clinic closed. "I'll probably go to Charity [hospital] and die," said Mrs. Lillian Jackson, a 70-year old patient" who once relied on the Lower Ninth Ward clinic for healthcare (Lovell 1980). As of 1993, the infant mortality rate in New Orleans was among the highest in the United States, and the rate (26/1000) in the Lower Ninth Ward was above the city average and more than twice the national average (Nabonne 1993).

When the incidence of violent crime peaked in New Orleans during the late 1980's and early 1990's, police response time to calls in the Lower Ninth Ward appears to have been slow.

With the Desire and Florida public housing developments and other poor enclaves within its boundaries, the district generates more than 10,000 calls for service monthly, and response times have occasionally been extraordinarily long—as long as 12 hours on a busy night for calls in the Lower 9th Ward. (Warner 1995)

It is likely that the Industrial Canal and its various drawbridges made it difficult for police to enter the neighborhood during one of the most violent eras in the history of New Orleans. As

instances of violent crime increased in New Orleans during the years leading up to Hurricane Katrina, references to the neighborhood portrayed it as “the murder capital of the murder capital” (Etheridge 2004; Landphair 2007). One resident later complained to a reporter, “we only made television or the paper when someone was shot and killed...” (Etheridge 2004). Such accounts stand in sharp contrast to the accounts of other neighborhood residents who view the neighborhood as historically being safe and family-oriented (Giancarlo 2011).

Frustration over the multiple drawbridge crossings at the Industrial Canal continued during the decades between hurricanes Betsy and Katrina. “In the 1920’s when it was being dug, the Inner-Harbor Navigation Canal was just a ditch that a lot of people thought was folly in the first place. Today, the many bridges crossing it cause motorists lots of irritation; and the smog it raises hangs like a blanket over eastern and downtown sections of the city” (\$100 Million 1965). In an editorial published by the Times-Picayune in 1971, a resident opined that “the building of the Industrial Canal bridge did much to divide the city and cut off this area, which has never received its proper share of maintenance...” (Blaise 1971).

Bridge repairs and maintenance would also be a source of frustration for area residents. In the 1980’s, Lower Ninth Ward activist Charles Blaise suggested to Councilman Wayne Babovich that “A short term change of operation in bridge repair situations would be cost-effective for everyone, and certainly would help those residents below the Industrial Canal who are trying to get to work or school” (Blaise 1985). Blaise’s complaint stemmed from a series of bridge closures that complicated commuting to and from the Lower Ninth Ward. Lower Ninth Ward residents were also angered in 1989 after a cargo ship in the Industrial Canal struck the Florida Avenue Bridge. While the eastbound side of the bridge remained closed for an extended period of time, the westbound side was allegedly kept open for the convenience of *Southern*

Scrap, a scrapyard located near the foot of the bridge in the Lower Ninth Ward. *Ninth Ward Neighborhood Council* president Lloyd Brown criticized the Dock Board (operator of the Florida Avenue Bridge) for placing the interests of a private entity above those of Lower Ninth Ward residents (Crippled 72-Year-Old 1989).

Hurricane Betsy and social changes in the 1960's significantly changed the trajectory of the Lower Ninth Ward. After experiencing decades of growth, the population in the neighborhood began to decline in 1960. Flooding due to the failure of the Industrial Canal levee inundated the Lower Ninth Ward and raised questions about the provision of yet another public service—hurricane protection. Isolation relative to the Industrial Canal and drawbridges was intensified in the 1970's when a floodwall was also erected along the banks of the Industrial Canal.

While media accounts and other observations cast the Lower Ninth Ward in a negative light leading up to Hurricane Katrina, many residents challenged that perception. One resident explained that there is “a lot of misinformation and misconceptions about the Lower Ninth Ward. That canal divided us from the rest of the world. So many stories were made up about our community. But in truth it was a blue collar community” (Giancarlo 2011, 122). Other residents viewed the isolation of the tight-knit Lower Ninth Ward as a strength: “The teachers, the principals, the lawyers, the doctors, the undertaker, the postal worker...everything we needed was right there” (Giancarlo 2011, 122). In reference to the portrayal of social conditions in the Lower Ninth Ward, another resident contends that

A lot of people go back to saying about how poor this area was, or whatever. However, when I grew up we didn't understand what poor was... So to me that community gave me a moral and ethical

value system... To me this was a proud area. (Giancarlo 2011, 120)

Finally, a resident whose family moved to the Lower Ninth Ward in the late 1960's recalls, "we all grew up in a community that was more like a village... We used to sleep with our windows open" (Giancarlo 2011, 120). To those residents whose voices are available, the isolated location of the Lower Ninth Ward created a close-knit community.

6.4 Hurricane Katrina and Beyond (2005-2012)

Disinvestment by businesses and white flight were pronounced in the Lower Ninth Ward during the decades between hurricanes Betsy and Katrina, and by the time Hurricane Katrina struck 36% of people in the neighborhood were living in poverty (Dyson 2006). Hurricane Katrina struck New Orleans on August 29, 2005, and has since been considered one of the worst natural disasters in United States history. However, it may be a stretch to call the event "natural," considering that levee and floodwall failures were once again a major factor in the impact the storm would have on life and property. A 2006 study conducted by the National Science Foundation's Independent Levee Investigation Team found that at least 75-80% of the flooding in New Orleans during Hurricane Katrina was a direct result of flawed levee and floodwall design (Freudenburg, et al 2009, 96). Technological failures and consequences during Hurricane Katrina speak to the *natech* attributes of the event and the role that industry and the state played in the destruction of the Lower Ninth Ward and other parts of New Orleans (Picou 2009). Approximately 1,500 people perished in Louisiana alone during the event, and the damage to property is said to have exceeded \$25 billion (CBS News 2010).

While Hurricane Katrina impacted much of the city of New Orleans, the experience in the Lower Ninth Ward was particularly devastating, as 99.9% of all homes in the neighborhood

were damaged or destroyed during the event (Logan 2006). Neighborhood barriers such as the Industrial Canal, the floodwall and drawbridges featured prominently in post-Katrina images of the Lower Ninth Ward, which became somewhat of a “poster child” for the Katrina event.

Figure 6-5:

Lower Ninth Ward residents walk across the St. Claude Avenue Bridge to flee the floodwaters of Hurricane Katrina (Getty Images 2009)



Many observers retrospectively acknowledged the plight of the Lower Ninth Ward leading up to Hurricane Katrina, as indicated by historian John Barry during an interview regarding the social dimensions of the event:

The very construction of the Industrial Canal in 1922 helped choke off poorer New Orleans blacks, historians say... Ever since then, that part of the Ninth Ward has been orphaned... That canal is a manmade body of water that’s separated from the rest of the city. They’ve gotten no services ever since. Part of that is because they’re poor and black. Nobody cared. Some of that area was developed, but a lot of it wasn’t. (Deep distrust 2005)

In a post-Katrina hazard modeling and mapping exercise designed by Federal Emergency Management Agency (FEMA) officials, the Lower Ninth Ward is used as a case study and described as an “isolated” neighborhood, historically exposed to hazards and lacking dependable public services (FEMA 2011). Finally, in his post-Katrina assessment of the Lower Ninth Ward, Dyson (2006) states that “the Lower Ninth Ward is a perfectly bleak example of the concentrated poverty the city’s poor black residents confront. [It] is symptomatic of the geographical isolation on which concentrated poverty feeds” (Dyson 2006, 10).

As interest in the Lower Ninth Ward increased following Hurricane Katrina, the media began to delve into the neighborhood’s past, tracing the roots of an area that has been considered “ground zero” of one of the worst disasters in United States history. As journalists and others did a retrospective analysis of the lower ninth ward, they reported the area only as distressed. “In 1923, the parish [St. Bernard] and New Orleans’ Lower 9th Ward were separated from the city when the Industrial Canal was dug” (Burdeau 2011). In a series of interviews conducted by the Times-Picayune in 2009, elderly Lower Ninth Ward interviewees recalled life in the neighborhood back in the 1950’s and 1960’s: “Municipal water and electricity were implemented unevenly... The Lower 9th Ward may have gotten media attention for its post-Katrina images of wilderness, but it was ‘country’ from its earliest days” (Schleifstein 2009, November). Photos and renderings of the Lower Ninth Ward following Hurricane Katrina tend to portray the neighborhood as an area where barriers such as the Industrial Canal, drawbridges, and floodwall were all that remained.

Figure 6-6:

A post-Katrina sketch of the Industrial Canal floodwall in the Lower Ninth Ward (Lawler 2011)

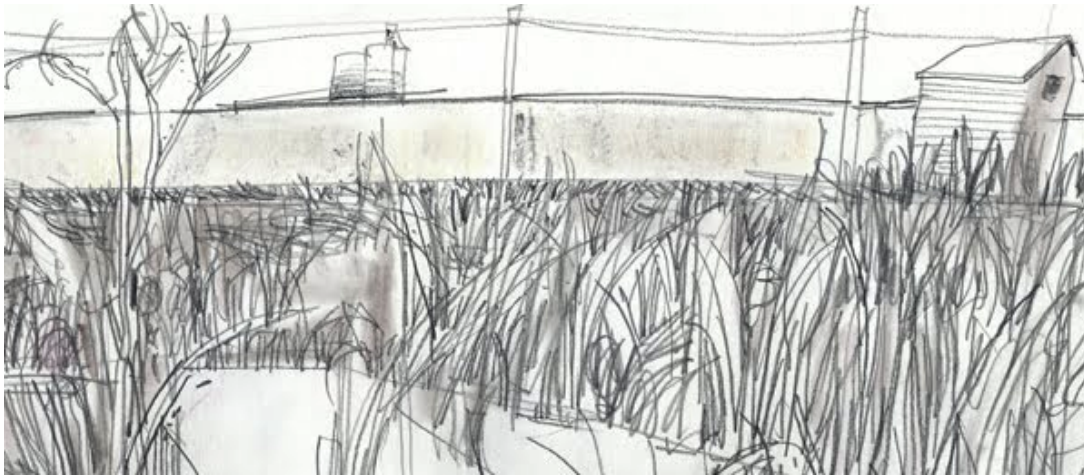


Figure 6-7:

A post-Katrina photo of the Florida Avenue Bridge in the Lower Ninth Ward (Richards 2009)



As Katrina's floodwaters receded and the Lower Ninth Ward began to recover, the bridges and floodwall became national icons. These barriers became symbolic of everything that went wrong during Hurricane Katrina, and have since been used for various types of Hurricane Katrina memorial events and public protests (Getty Images 2010; Times-Picayune 2011, August).

Figure 6-8:

A Katrina memorial service is conducted at the base of the Industrial Canal floodwall in the Lower Ninth Ward (Getty Images 2010)



Figure 6-9:

A Katrina memorial service is conducted on the Claiborne Avenue Bridge in the Lower Ninth Ward (Times-Picayune 2011, August)



Despite the iconic status of the bridges in the Lower Ninth Ward, issues with closures and interruptions to life in the neighborhood and in St. Bernard Parish persisted. In response to an ongoing round of repairs to the Claiborne Avenue Bridge and lengthy bridge closures, State

Representative Nita Hutter explained to a Times-Picayune reporter “it’s awful scary. There’s no hospital here” (Warren 2010). The Times-Picayune also noted “residents of the Lower 9th Ward and St. Bernard Parish have long had a testy relationship with the various drawbridges spanning the Industrial Canal” (Warren 2010). Hutter’s statement regarding the lack of a hospital on the east side of the Industrial Canal was accurate, and later in 2010 the only health clinic to open in the Lower Ninth Ward since Hurricane Katrina eventually closed. The closure was due to a lack of clientele, and clinic administrators claimed that “crossing the Industrial Canal is still a barrier” to attracting clientele from the west side of the Industrial Canal (Barrow 2010). As with the 1980 closure of the Lower Ninth Ward public health clinic, the neighborhood’s location east of the Industrial Canal seems to have been at least part of the reason for the 2010 closure.

Lapses in the provision of public services also persisted in the Lower Ninth Ward following Hurricane Katrina. When asked about blight in the neighborhood, a resident simply stated, “I don’t feel like I’m part of this city. I feel like I’m not considered. I’m a forgotten part of this city, even though I pay taxes” (McCarthy 2010). In 2011, a corpse was discovered inside of a burned car in the Lower Ninth Ward:

This is the second burned car within weeks to appear in their neighborhood... The couple, who moved into the Lower 9th Ward in 1965, said their efforts to get the city and others to care for their property have failed as well. Consequently, the area they live in has become attractive for bad guys looking for a place to hide things... (Williams 2011).

In 2011, residents and city officials would consider creating a new political boundary east of the Industrial Canal for the third time since the canal was constructed. When the City of

New Orleans was considering changing the boundaries of its council districts, residents east of the Industrial Canal expressed interest in establishing their own district. “We are hoping the lines are drawn at the Industrial Canal...because we have more in common with District E in the rebuilding process” (Krupa 2011) The resident went on to say “it doesn’t take a rocket scientist to put everyone east of the Industrial Canal in one district” (Krupa 2011).

Figure 6-10:

A political cartoonist’s take on social conditions and hurricane protection in New Orleans (Zyglis 2006)



While Hurricane Betsy had been the major watershed moment for an earlier generation of Lower Ninth Ward residents, the loss of life and property experienced during Hurricane Katrina was unparalleled. After 99.9% of all structures in the working-class, African-American neighborhood were damaged or destroyed during the event, images and other media portrayals of the Lower Ninth Ward featured the neighborhood barriers (the Industrial Canal, floodwall, and drawbridges) and made the neighborhood a focal point of the Hurricane Katrina disaster and recovery (Logan 2006). There were over 1,700 vacant housing units in the neighborhood as of

2010, not including those that have already been demolished since Hurricane Katrina (Greater New Orleans Community Data Center 2012).

Isolation and lapses in the provision of public services continue to be ongoing issues for Lower Ninth Ward residents, and media coverage of the Lower Ninth Ward has largely perpetuated stereotypes of the neighborhood as a marginal and distant backwater (Landphair 2007). A 2012 *New York Times* article entitled “Jungleland” features the post-Katrina landscape in the Lower Ninth Ward and highlights abandonment and blight in the neighborhood (Rich 2012, March). The article also describes the presence of overgrown vegetation, exotic plants and wild animals in the Lower Ninth Ward and the City’s efforts to assist in cleaning the neighborhood.

Despite the stereotypical portrayals of the Lower Ninth Ward, the neighborhood continues to garner a considerable amount of goodwill. Brad Pitt and his *Make it Right Foundation* have now constructed a total of 86 green, energy-efficient homes in the Lower Ninth Ward (MacCash 2012, August). Pitt even enlisted the services of celebrated architect Frank Gehry to assist in designing some of the homes (MacCash 2012, July). Pitt plans on constructing a total of 150 homes in the Lower Ninth Ward as part of the Make it Right project (MacCash 2012, July). Other celebrities, including rapper and New Orleans native Lil’ Wayne, have also made contributions to revitalizing the Lower Ninth Ward. Wayne recently partnered with a major soft drink company to open the *Trukstop* skateboard park in the Lower Ninth Ward, a unique facility that is intended to provide new recreational opportunities to area residents (Fensterstock 2012).

Although Lower Ninth Ward residents continue to contend with the three drawbridges traversing the Industrial Canal, the City of New Orleans is considering expanding streetcar

services to St. Claude Avenue and Poland Avenue, just west of the Industrial Canal. While this expansion would certainly not resolve all public transportation issues east of the Industrial Canal, it would provide easier access to a vital means of public transportation for the first time in generations and would somewhat mitigate the isolated disposition of the Lower Ninth Ward (Donze 2011, January). There are currently no plans to extend the streetcar line across the Industrial Canal and into the Lower Ninth Ward itself.

Map 6-6:

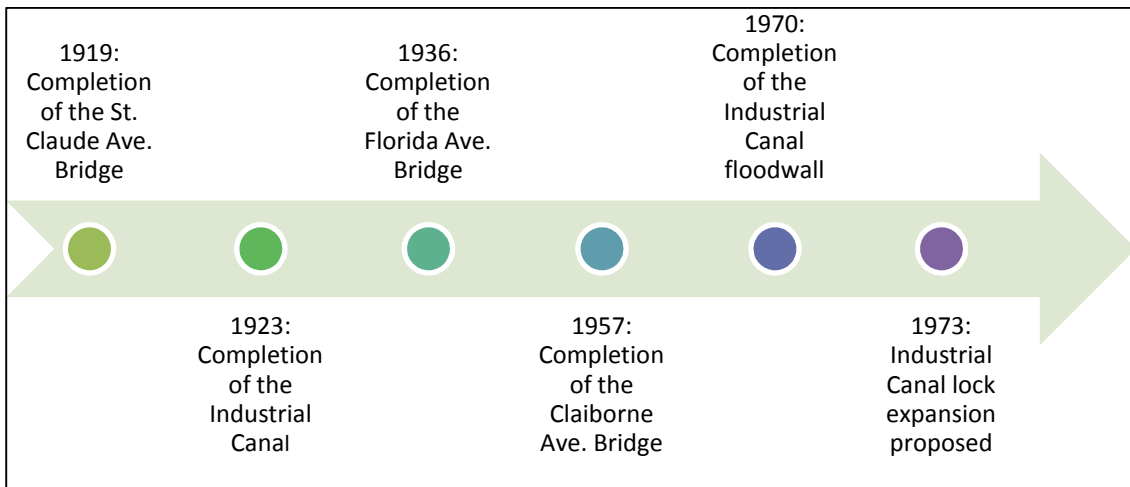
The City of New Orleans has proposed to extend public streetcar transportation services down St. Claude Avenue to Poland Avenue, just across the Industrial Canal from the Lower Ninth Ward (Donze 2011, January)



The City of New Orleans has also recently allocated nearly \$2 million for the purpose of enhancing the Claiborne Avenue and St. Claude Avenue streetscapes (Egler 2012). The project includes the repaving of sidewalks along the median, and the installation of palm trees and a number of pieces of relevant neighborhood art. Preliminary plans are also underway for the construction of a public school integration monument near Louis Armstrong Elementary School (formerly McDonough No. 19) in the Lower Ninth Ward.

Figure 6-11:

A number of accessory infrastructure projects relative to the Industrial Canal have intensified the isolation of the Lower Ninth Ward during the twentieth century



6.5 Conclusion

The Industrial Canal isolated the Lower Ninth Ward from the rest of New Orleans and also increased development in the neighborhood. Isolation in the Lower Ninth Ward intensified as accessory structures (drawbridges, levees, and floodwall) and component waterways (GIWW and MRGO) were constructed around the canal. The isolation of the Lower Ninth Ward contributed to lapses in the provision of municipal services and hurricane protection, making the neighborhood increasingly vulnerable over time. While many other factors contributed to the Lower Ninth Ward becoming distressed since the 1960's, the impacts of hurricanes Betsy and Katrina on the neighborhood were exacerbated by the presence of the Industrial Canal and had the immediate effect of accelerating disinvestment and abandonment.

The data suggest that while public officials and other Industrial Canal project boosters generally regarded the Ninth Ward and Lower Ninth Ward sites as being largely uninhabited at the time the area was selected for construction of the canal, they also acknowledged the impact the canal would have on the geography and future development of the city. After the Industrial

Canal created a distinct neighborhood on its eastern bank, other accessory structures such as drawbridges, levees, and floodwall intensified the isolation of the Lower Ninth Ward. Wacquant (2008); Dyson (2006); Freeman (2006); Marcuse (1997); and Logan and Molotch (1987) all found isolation to be a common characteristic produced by outside structural forces vis-à-vis distressed neighborhoods.

Weise (2004) and Jackson (1985) found isolation to also be a common characteristic of African-American suburbs. According to Weise (2004), even African-American suburbs “occupied cheap, often nuisance-prone land. Many were geographically cut off by railroads or other physical barriers...many African-American suburbs also lacked basic public infrastructure” (Weise 2004, 17). While the Lower Ninth Ward cannot be considered a ghetto or a suburb, neighborhood attributes speak to the ways it is distressed (isolated and poor) and suburban (separated from the city and high rate of homeownership), as well as both urban (part of a large city) and rural (vacant land and a low population).

The construction of the GIWW and MRGO navigation canals would also intensify isolation and development in the Lower Ninth Ward, exacerbating the vulnerability of the neighborhood’s fragile coastal environment. The population of the Lower Ninth Ward increased by 64% between 1920 and 1940, peaking in at 33,000 in 1960 (Landphair 1999; 2007). However, lapses in the provision of municipal services such as road lighting, sewerage and sanitation, schools, police and fire protection, and hurricane protection in the Lower Ninth Ward became pronounced in the neighborhood during the decades leading up to the 1970’s. The neighborhood underwent significant changes between 1960 and 1970 when 77% of the white population fled the neighborhood and the poverty rate rose to 23% (Landphair 1999; 2007). In the case of the Lower Ninth Ward, the conflation of the neighborhood’s isolated geographic

location; rapidly changing racial composition; and growing rate of poverty all speak to the ways in which the neighborhood faced significant challenges leading up to Hurricane Katrina

While some degree of social change in the Lower Ninth Ward could certainly be attributed to larger societal changes such as white flight and suburbanization, the devastating impact that Hurricane Betsy had on the Lower Ninth Ward housing stock (80% damaged or destroyed) and continued isolation and lapses in the provision of municipal services east of the Industrial Canal made the neighborhood more vulnerable leading up to Hurricane Katrina (Dyson 2006). According to Sen (1981); Pelling (2003); Cutter, et al (2003); and Beck (2009), vulnerability is the product of marginality and inequality. As a neighborhood that lacked economic and political assets leading up to Hurricane Betsy, the susceptibility of the neighborhood to environmental risk was heightened. This predicament was compounded by the physical vulnerabilities associated with the location and presence of the Industrial Canal.

During the decades between hurricanes Betsy and Katrina, persistent isolation and lapses in municipal services persisted in the Lower Ninth Ward. Most importantly, adequate hurricane protection had still not been provided to the neighborhood. According to Chambers (1989), vulnerability is magnified over time by exposure to hazards, and certainly the Lower Ninth Ward had become more vulnerable leading up to Hurricane Katrina. When Hurricane Katrina struck, the population of the Lower Ninth Ward had declined to just over 14,000 and 36% of all residents were living in poverty (US Census Bureau 2000; Dyson 2006). Nearly 100% of the Lower Ninth Ward housing stock was damaged or destroyed during Hurricane Katrina, and by 2010 the population had declined to under 3,000, making it the lowest it had been since 1900 (Logan 2006; American Community Survey 2006-2010; Campanella 2009). As of 2010, over 1,700 vacant housing units remained in the Lower Ninth Ward, not including the thousands

that had already been demolished since Hurricane Katrina (Greater New Orleans Community Data Center 2012).

The network of barriers (navigation canals, drawbridges, levee, and floodwall) constructed around the Lower Ninth Ward during the twentieth century stimulated growth in the neighborhood and also isolated the neighborhood from the rest of New Orleans, setting off a pattern of municipal neglect and decline that ultimately made the neighborhood more vulnerable. Hurricanes Betsy and Katrina exposed and exacerbated the vulnerabilities of the Lower Ninth Ward, contributing to the loss of approximately 90% of the neighborhood's population between 1960 and 2010. Logan and Molotch (1987) have found, "the most vulnerable participants in place markets are those with the fewest alternatives," and it is not surprising that the isolated and vulnerable Lower Ninth Ward would also be disproportionately exposed to hazards.

7 Hazards and Risk

The Lower Ninth Ward became a household name following the extensive media coverage during and after Hurricane Katrina. While most observers from outside of the New Orleans metropolitan area are likely to have perceptions of the Lower Ninth Ward based solely on the Katrina event, the degree to which exposure to hazards had previously characterized the Lower Ninth Ward is generally unknown. The neighborhood experienced a number of hazards decades before Hurricane Katrina ever made landfall. In an editorial published by the Times-Picayune in 1971, a frustrated Lower Ninth Ward resident provided a familiar commentary on the neighborhood's image: "It seems the Lower Ninth Ward is always played up as a disaster area" (Blaise 1971). Another Lower Ninth Ward resident would later recall, "we only made television or made the paper... when there was enough water [on the streets] to show cars driving slowly through the floodwaters" (Etheridge 2004).

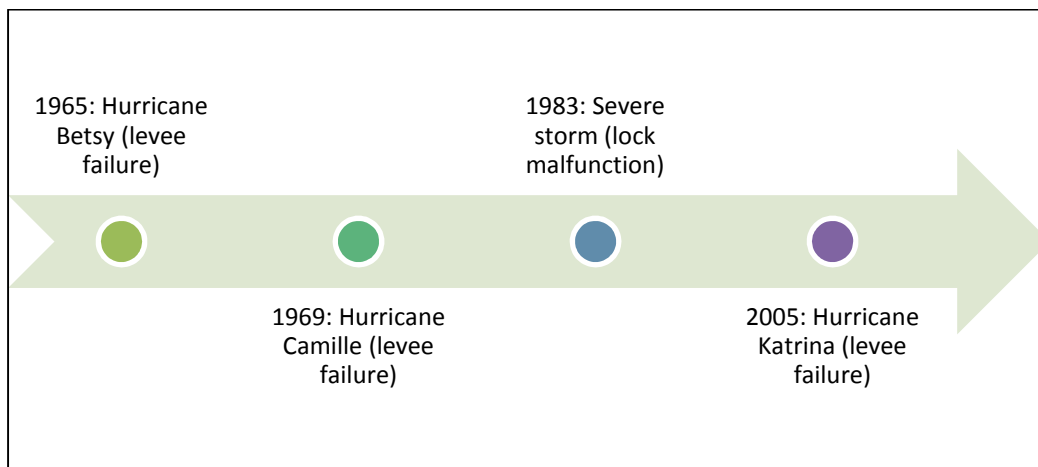
Floods have been the most obvious and well-known hazards experienced in the Lower Ninth Ward, but the data indicate that many lesser-known hazards plagued the neighborhood for decades. Furthermore, the degree to which flood hazards in the Lower Ninth Ward could be considered natural or "man-made" is a matter of debate among neighborhood residents and observers who think the Lower Ninth Ward's susceptibility to flooding is simply part of the pattern of municipal neglect experienced in the neighborhood. Over the past century, the Lower Ninth Ward has experienced a variety of hazards relative to the presence of the Industrial Canal—a *modern* infrastructure project in Giddens and Beck's sense of the term—that was constructed for the purpose of furthering commercial interests in New Orleans.

After experiencing two catastrophic flood events in a matter of just forty years (1965-2005), significant strides have been taken to improve hurricane protection in the Lower Ninth

Ward. Over 14 billion has been spent on levee and floodwall improvements in the area, and 1 billion has been spent on a surge barrier that was designed to reduce the impact of storm surge along the Industrial Canal (Grissett 2009). Efforts to improve hurricane protection in the area were tested when Hurricane Isaac struck New Orleans on the seventh anniversary of Hurricane Katrina, and the Lower Ninth Ward did not flood during the event. However, like the Industrial Canal itself, the upgraded hurricane protection system also consists of a network of modern infrastructure projects, and historical failures of such systems in the Lower Ninth Ward and elsewhere speak to the perpetual vulnerability of the neighborhood and its tenuous position vis-à-vis flood hazards.

Figure 7-1:

The Lower Ninth Ward experienced a number of major flood events during the past fifty years



7.1 Floods

The city of New Orleans is surrounded by water and located mostly below sea level. Consequently, the city is flood-prone and has struggled with drainage since its existence. Since the New Orleans area was first developed, levees were commonly erected for the purpose of fending off riverine flooding from the Mississippi River. As indicated in Figure 7-2, the area that would eventually become the Lower Ninth Ward was no exception. The Ursuline Convent, once

located at the approximate point where the Industrial Canal would intersect with the Mississippi River and separate the Lower Ninth Ward from the rest of the city, had long been protected by the levee located in the foreground of the photo. However, it has been said that because this area is located near a sharp bend in the Mississippi River, such levees were easily eroded and that the neighborhood historically experienced riverine flooding (Behrman 1914). Improvements to the Mississippi River levee following the Great Mississippi River Flood of 1927 have since protected the Lower Ninth Ward area from being flooded by that body of water.

Figure 7-2:

The Ursuline Convent was sold and demolished so that the Industrial Canal could be dug through the Ninth Ward (Allison 1900)



Exposure to flood hazards in the Lower Ninth Ward was initially the result of a lack of drainage infrastructure in the neighborhood. However, the failure of hurricane protection levees along the Industrial Canal would become a more significant issue during the second half of the twentieth century. In 1947, railroad embankments along Florida Avenue in the Lower Ninth Ward (which doubled as levees) failed during a hurricane and caused extensive flooding in the neighborhood (Youngman 2011). “Several families were removed from housetops as water

moccasins swam dangerously close...the real suffering was experienced by the mothers who had young babies in their arms. Many of them told of narrowly escaping” as the embankments broke and the water rushed into their homes (MacWilliams 1947).

Correspondence from the Ninth Ward Civic and Improvement League to the City of New Orleans regarding street flooding in the Lower Ninth Ward can be found as far back as 1955, when the neighborhood association complained about “flooded and muddy streets” (Lower Ninth Ward Civic and Improvement League 1955). The association would later express concerns about flooding at the Lower Ninth Ward playground: “During inclement weather the playground becomes flooded and remains so for days and sometimes weeks... The grounds have become mosquito ridden and swamp-like” (Luke 1957, August).

A devastating flood event would occur in the Lower Ninth Ward in 1965 when levees along the Lower Ninth Ward side of the Industrial Canal failed during Hurricane Betsy and inundated much of the neighborhood with six to twelve feet of water. Photos taken during the Betsy event bear a striking resemblance to photos taken forty years later during Hurricane Katrina, depicting African-Americans (both dead and alive) in the floodwaters (see Figure 7-3). “Eighty percent of the Lower Ninth Ward district was under water... Many residents viewed Hurricane Betsy as the beginning of the downward turn for the neighborhood” (FEMA 2011). Five months after Hurricane Betsy, the Times-Picayune found that “nearly 40% of the residents have not moved back into the neighborhood” (9th Ward Area 1966). This slow rate of return speaks to the significance of the Betsy event and the slow response of public officials.

Figure 7-3:

The corpse of a Hurricane Betsy flood victim floats onto the base of the Claiborne Avenue Bridge in the Lower Ninth Ward, 1965 (Times-Picayune 2011, November)



Neighborhood lore alleging the intentional destruction of levees in the Lower Ninth Ward would begin immediately following Hurricane Betsy. Cognizant of the fact that levees in Poydras, Louisiana (approximately ten miles downriver from the Lower Ninth Ward) were intentionally destroyed by the City of New Orleans and others during the Great Mississippi River Flood of 1927 in order to relieve water pressure on area levees and spare commercial interests upriver, many Lower Ninth Ward residents “were certain that officials had intentionally blew up the Industrial Canal [levees]” during Hurricane Betsy (Barry 1997; Landphair 2007, 841). Lower Ninth Ward resident and popular R and B musician Charmaine Neville explained in 2006 that “I don’t care what anyone says: They blew the canal. They blew it in 1927 and when my mother was young, during Betsy” (Horne 2006, 117). Another resident would later claim “they did it with Betsy, where they blew up the levee to save the French Quarter. They really don’t like the Lower Ninth Ward because of uppity black people” (Giancarlo 2011, 118).

Rumors that levees in the Lower Ninth Ward had been intentionally destroyed during Hurricane Betsy in order to spare other neighborhoods from flooding were rampant following the hurricane. A handbill and telephone call campaign was initiated as a means of informing

residents of the alleged sabotage, and the national headquarters of the National Association for the Advancement of Colored People (NAACP) would eventually contact the New Orleans NAACP chapter in order to inquire about the situation (Haas 2004). Narratives and neighborhood lore regarding the intentional destruction of levees during Hurricane Betsy would persist, ultimately informing similar perceptions of levee and floodwall failures in the Lower Ninth Ward forty years later during Hurricane Katrina.

Ongoing issues in the Lower Ninth Ward, such as poor drainage and needed street improvements, began to command more attention following Hurricane Betsy (9th Ward Plans 1966). The media also began to highlight social conditions in the Lower Ninth Ward following Hurricane Betsy (Urban Renewal 1967; Nearly Double 1967; Urban Renewal 1969). Nonetheless, plans to improve hurricane protection “in one of the hardest hit areas during the 1965 disaster” would begin shortly after Hurricane Betsy, and the Orleans Levee Board publicly stated that the Lower Ninth Ward would remain vulnerable “until sheet piling and various earth and concrete works are completed” (Nearly Double 1967; Sossaman 1969).

Despite promises to improve drainage and hurricane protection in the Lower Ninth Ward following Hurricane Betsy, the neighborhood would continue to be threatened by flood hazards. Because of St. Bernard Parish’s location east of the Industrial Canal near the Lower Ninth Ward, public officials there became interested in levee protection along the canal following hurricanes Betsy and Camille. After levees once again partially failed along the eastern banks of the Industrial Canal during Hurricane Camille (1969), Irvin Janssen of the neighboring Lake Borgne Levee District (previously based in St. Bernard Parish) openly criticized the efforts of the Orleans Levee Board. “If the Orleans Levee Board can maintain airports, build elaborate marinas for boats, and create ‘spectacular’ fountains along Lakeshore Drive, they can afford to

protect its citizens” in the Lower Ninth Ward (Orleans levee 1969). St. Bernard Parish political figure Sammy Nunez similarly expressed concerns about the levees along the eastern banks of the Industrial Canal, claiming that they were in need of “complete renovation” (Orleans levee 1969). Finally, St. Bernard Parish police juror Louis Munster stated at a public meeting “that the Orleans Levee Board would be responsible for flooding the citizens of the Lower Ninth Ward if the board president doesn’t familiarize himself with his territorial jurisdiction” (Orleans levee 1969).

The data suggest that Lower Ninth Ward residents’ confidence in the neighborhood’s level of hurricane protection was further diminished following the Camille event. Although levee breaches along the eastern banks of the Industrial Canal only caused minor flooding during Hurricane Camille, the event captured the attention of area residents. In an editorial entitled “9th Ward Protest,” a resident made the following observation:

It appears that the levees along the Industrial Canal are not in much better condition than they were during Betsy, since they could not sustain the slight rise in tide and hurricane, or less than hurricane, winds. We should all say a prayer of thanks for sparing New Orleans the full effects of Camille. (Magee and Roberts 1969)

Later that same year, the United States Corps of Engineers (USACE) promised residents of the Lower Ninth Ward that “inhabited and developed areas of the Lower Ninth Ward south of the Gulf Outlet and St. Bernard will have levee protection at or exceeding federally set heights by the next hurricane season” (Outlet-Paris 1969). By 1970, the Lower Ninth Ward floodwall would be well under construction (Lower 9th Ward 1970).

While the USACE constructed the new hurricane protection system, it was forced to defend the navigation canal it had constructed just one decade earlier. Residents of the Lower Ninth Ward and St. Bernard Parish filed a lawsuit against the federal government in 1971 for constructing a navigation channel that increased exposure to flood hazards, and for failing to adequately protect the area from such hazards. Since the Mississippi River Gulf Outlet (MRGO), connecting the Industrial Canal to the Gulf of Mexico, had been substantially completed by the time Hurricane Betsy struck New Orleans, *Graci v. United States* (1977) was filed against the federal government “for damages arising from that flooding, alleging that the United States was negligent in designing, constructing and operating” the new shipping channel (In Re Katrina Canal Breaches Consolidated Litigation 2009). The courts found that the plaintiffs in the case had failed to prove any fault or negligence on the part of the government. However, *Graci v. United States* did establish that the United States Army Corps of Engineers (USACE) “could be held liable for damages arising out of activities surrounding a navigation channel notwithstanding the fact that those actions caused the failure of certain levees” (In Re Katrina Canal Breaches Consolidated Litigation 2009, 2).

Residents east of the Industrial Canal and elsewhere would again take legal action against the federal government following Hurricane Katrina. Litigation involving the “funnel effect” that the MRGO and Industrial Canal had during Hurricane Betsy is what prompted plans for increased hurricane protection. However, such plans faced “numerous obstacles and changes and indeed was not totally completed by the time Hurricane Katrina hit...” (In Re Katrina Canal Breaches Consolidated Litigation 2009, 9). United States District Court Judge Stanwood Duval would also find that the USACE had knowledge of the impact the MRGO had on the coastal environment leading up to Hurricane Katrina (In Re Katrina Canal Breaches Consolidated

Litigation 2009). Duval highlighted a number of federal documents as evidence of the government's negligence since the MRGO was constructed, including an internal 1962 USACE report that pointed to a "notable current velocity increase" in the Industrial Canal caused by the MRGO (In Re Katrina Canal Breaches Consolidated Litigation 2009, 33).

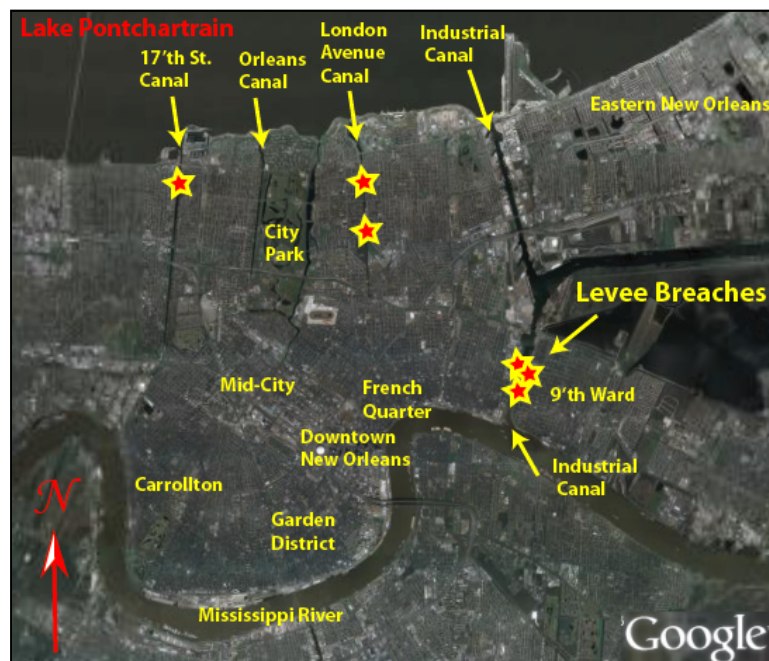
Although Hurricane Betsy marked the most significant flood event in the Lower Ninth Ward during the twentieth century, the threat of flooding due to hurricanes and heavy rain events would persist in the Lower Ninth Ward. A study conducted in 1979 by the Office of Policy and Planning found drainage to be a problem in the Lower Ninth Ward and that one-third of all blocks in the neighborhood did not have drains at all (Office of Policy and Planning 1979). In terms of flooding associated with storm surge, a hypothetical hurricane exercise conducted in 1981 illustrated the degree to which the Lower Ninth Ward was exposed leading up to Hurricane Katrina:

The greatest and most dangerous portion of the surge will be spreading over most areas below 8 to 12 feet above mean sea level during the next few hours. In fact it now appears that even the highest levee systems may be over topped, especially those in the eastern parts of New Orleans east of the Industrial Canal. (National Weather Service 1981)

A heavy rain event flooded a ten-block stretch of the Lower Ninth Ward near the Industrial Canal and Florida Avenue in 1983 (Few areas 1983). Although the loss of life and property experienced in the Lower Ninth Ward during Hurricane Betsy would be unparalleled until Hurricane Katrina, the neighborhood's exposure to flood hazards became widely known during the decades in between.

A significant amount of the total damage resulting from Hurricane Betsy occurred in the Lower Ninth Ward neighborhood, and the data indicate that the Lower Ninth Ward fared much worse during Hurricane Katrina than other neighborhoods in the city. During Hurricane Katrina, the levee and floodwall along the Industrial Canal in the Lower Ninth Ward were overtopped before eventually failing and flooding the neighborhood with 15-18 feet of water (Freudenburg, et al 2009, 98). Following the overtopping and failures, “water covered the Lower Ninth Ward, among the city’s most poorest and vulnerable communities” (Dyson 2006, 61).

Map 7-1:
Hurricane Katrina Levee/Floodwall Breaches (Geocaching 2011)

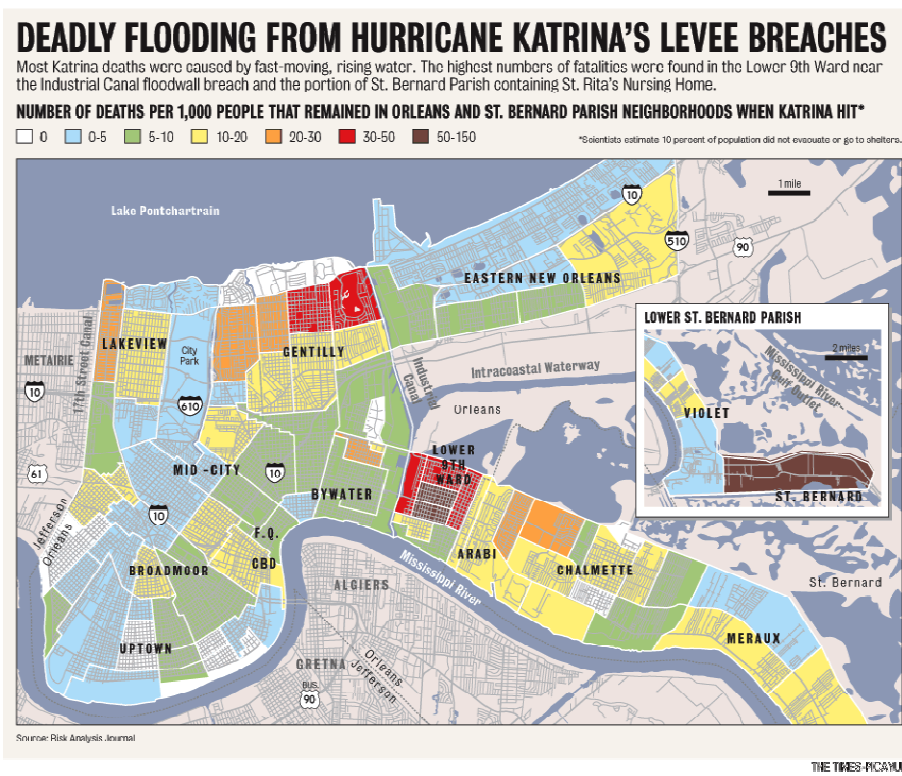


A recent Dutch study found that due to the sheer volume and velocity of the flooding which occurred in the Lower Ninth Ward during Hurricane Katrina, “citizens living close to the breach in the Lower Ninth Ward were five to seven times more likely to be killed by Katrina’s flooding than those who lived on the other side of the Industrial Canal” (Jonkman, et al 2009 cited in Freudenburg, et al 2009, 103). Furthermore, of the three major floodwall failures in New

Orleans during Katrina (London Avenue Canal, 17th Street Canal and the Industrial Canal), “the floodwaters that reached the Industrial Canal appear to have been 5-8 feet higher than those in the other two...” (Freudenburg, et al 2009, 97). As Map 7-2 and 7-3 indicate, levee/floodwall failures along the Industrial Canal intensified flooding in the Lower Ninth Ward and greatly contributed to the number of fatalities in the neighborhood during Hurricane Katrina.

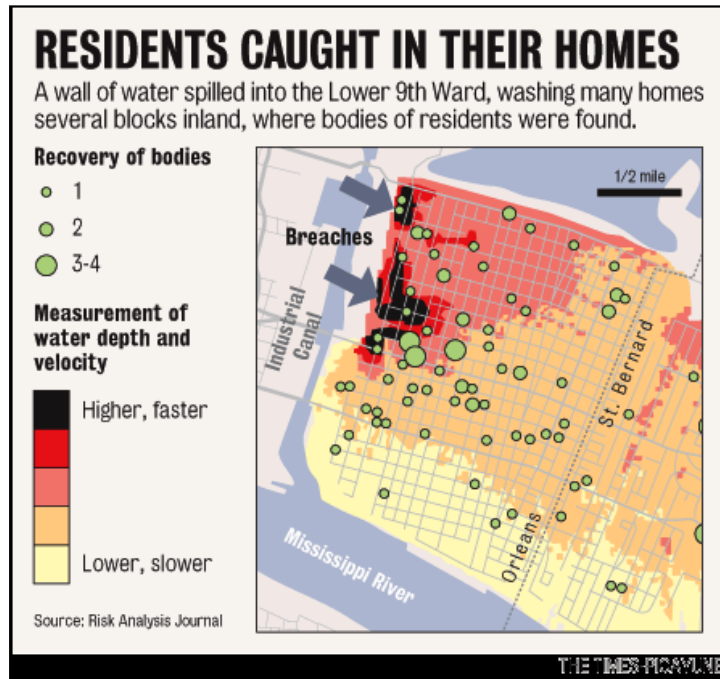
Map 7-2:

The Lower Ninth Ward experienced a disproportionate amount of fatalities during Hurricane Katrina due to the neighborhood’s proximity to the Industrial Canal (Times-Picayune 2009, August)



Map 7-3:

Hurricane Katrina Levee/Floodwall Breaches and Fatalities, Lower Ninth Ward (Times-Picayune 2009, August)



Cascading events relative to Hurricane Katrina and the Industrial Canal also occurred. A barge on the Industrial Canal was also blown from its moorings during the hurricane, allegedly crashing through the floodwall of the Lower Ninth Ward side of the canal and further exacerbating the high velocity flow of floodwaters into the neighborhood.

Prior to the storm, Lafarge had been warned to move the barge from the Industrial Canal, but the barge remained at the Lafarge dock. As anticipated, the barge was unable to sustain the storm that hit the coast of Louisiana with winds upwards of 100 miles per hour and eventually broke away from its moorings. The barge headed straight for the eastern Industrial Canal Floodwall, allegedly causing it to breach on impact. The breach in the Canal caused a massive surge of water to be released into the

neighborhood below, destroying everything in its path. Residents had only a few seconds to react and many lives were lost. (Barge Lawfirm 2010).

Figure 7-4:
Hurricane Katrina Barge Crash, Lower Ninth Ward (Grunfeld 2005)



Once only a monument to the severity of Hurricane Katrina, the Lafarge barge that allegedly crashed through the Lower Ninth Ward floodwall during the hurricane would become the subject of litigation. In 2008, United States District Court Judge Ginger Berrigan found that the owner of the barge was not liable for any damages sustained in the neighborhood (Krupa 2011). Later, United States District Court Judge Stanwood Duval would similarly rule that the mooring company was also not liable, and that “there is overwhelming evidence that the (barge) did not cause in any manner cataclysmic flooding of the Lower 9th Ward” (Krupa 2011).

The media quickly singled-out the Lower Ninth Ward and St. Bernard Parish as ground zero of the Katrina event. The headline on the morning after the hurricane read “CATASTROPHIC: STORM SURGE INUNDATES 9TH WARD, ST. BERNARD” (Nolan 2005). The article pointed to Hurricane Betsy as the “landmark disaster of an earlier generation”

in New Orleans and began making comparisons between the two events (Nolan 2005). Many of the neighborhood narratives and images pertaining to Katrina were similar to those that followed Hurricane Betsy, and the two events were linked to one another and to the Lower Ninth Ward neighborhood. The Industrial Canal is also an integral part of the Betsy-Katrina narrative:

In 1923, the parish and New Orleans' Lower 9th Ward were separated from the city when the Industrial Canal was dug. It was designed to connect the trade corridor along the Mississippi River with industrial sites near Lake Pontchartrain, but turned into a flood maker that inundated both areas during Hurricane Betsy in 1965 and Katrina in 2005. (Burdeau 2011)

Figure 7-5:

The swollen corpse of a Hurricane Katrina flood victim is found floating in the Lower Ninth Ward, 2005 (Graythen 2005)



Another Betsy-Katrina commonality is the Lower Ninth Ward neighborhood lore that the Industrial Canal levee and floodwall were intentionally destroyed during both events in order to flood the Lower Ninth Ward and spare other parts of the city. Claims regarding the intentional

sabotage of levees in the Lower Ninth Ward have been part of New Orleans lore for decades, and were frequently referenced following Hurricane Katrina.

I'm a native of New Orleans and my grandmother was in Hurricane Betsy. Before she died, she told me that the levees were dynamited during Betsy to save the French Quarter. I'm telling you this because it is believed by New Orleans natives that the same thing happened during Katrina. (Blog comment 2006)

However, there are differences of opinion among residents regarding the intentional destruction of levees in the Lower Ninth Ward: "I am quite sure you have heard the rumors about explosives blowing up the levee...who in their right mind would be going down there in the middle of the storm and setting the dynamite to blow up that levee? But some people are clinging to that lie" (Giancarlo 2011, 119).

Perceptions of sabotage in the Lower Ninth Ward became national in scope following Hurricane Katrina as public figures weighed in on the levee failures: "I know some folks by the levee that keep on telling me they heard explosions. Same shit happened back in Hurricane Betsy in 1965" (Lil' Wayne 2006). African-American filmmaker Spike Lee and Nation of Islam leader Louis Farrakhan would also publicly allege that the Lower Ninth Ward had once again been intentionally flooded (Deep distrust 2005; Maher 2005).

The role that federal artificial navigation canals around New Orleans played in the destruction of Hurricane Katrina would also later be litigated. In *Robinson, et al v. United States* (2007), plaintiffs claimed that the government's neglect to properly construct and maintain the MRGO caused the Lower Ninth Ward and St. Bernard Parish to flood during Hurricane Katrina. Several expert witnesses testified to the realities of the "funnel effect" that the MRGO, Gulf

Intercostal Waterway, and Industrial Canal had on storm surge in the New Orleans area (In Re Katrina Canal Breach Consolidated Litigation 2009). It was demonstrated that the USACE had knowledge of such effects as far back as 1961. The USACE also openly admitted in 1988 that the MRGO “threatened human life” (In Re Katrina Canal Breach Consolidated Litigation 2009, 105). Judge Stanwood Duval ultimately ruled in favor of the plaintiffs:

The failure to maintain the MRGO properly compromised the Reach 2 Levee and created a substantial risk of catastrophic loss of human life and property due to its malfeasance. Nothing the Corps has introduced into evidence tips the balance into its favor. (In Re Katrina Canal Breach Consolidated Litigation 2009, 148).

In 2012, the ruling was overturned by an appeals panel (Fifth Circuit US Court of Appeal), which stated that the USACE could not be held financially liable for damages occurring during Hurricane Katrina due to the MRGO (Rosenthal 2012).

Hurricane Katrina brought about a number of other lawsuits pertaining to the Lower Ninth Ward. A company named Washington Group International (WGI) was sued for allegedly failing to properly backfill several excavation points along the Industrial Canal floodwall just months before Hurricane Katrina struck. In *Huey, et al v. Washington Group International, Inc.* (2010), plaintiffs claim that poor workmanship by WGI caused underseepage which eventually weakened and comprised the floodwall during Hurricane Katrina. The WGI case is still ongoing as of July 2012.

Whether flooding in the Lower Ninth Ward during Hurricane Katrina can be attributed to neglect or sabotage, the neighborhood became a lightning rod for the controversy surrounding the politics of disasters in the United States, and a *cause célèbre* and bellwether of the Hurricane

Katrina recovery. The neighborhood's national profile has made it the subject of visits from former United States Presidents Bill Clinton and George Bush, and several visits from current United States President Barack Obama (Help Holy Cross 2008; Associated Press 2009). Celebrities such as Brad Pitt have been active in providing aid to the Lower Ninth Ward, and Spike Lee made the neighborhood a focal point in his series of Hurricane Katrina documentaries (Something that 2008).

Despite the attention the Lower Ninth Ward garnered following Hurricane Katrina, its recovery continues to be quite sluggish. The Greater New Orleans Community Data Center has found that while approximately 19,500 people resided in the Lower Ninth Ward as of 2000, the population of the neighborhood has dwindled to just over 5,500 as of 2010, constituting a 72% decrease in population east of the Industrial Canal (Greater New Orleans Community Data Center 2012). Vacant lots and abandoned houses have also come to dominate the Lower Ninth Ward landscape (Greater New Orleans Community Data Center 2011).

Although the poor drainage and street flooding experienced in the Lower Ninth Ward during the early decades of the neighborhood's existence were not exceptional, the disproportionate impact that hurricanes Betsy and Katrina had on the neighborhood were notable. The role that the Industrial Canal played in the exacerbation of flooding during both hurricanes is supported by the data, particularly as it pertains to Hurricane Katrina. While floods due to levee/floodwall failures have been the most high profile hazards experienced in the Lower Ninth Ward, the presence of the Industrial Canal has also exposed the neighborhood to a number of other hazards.

7.2 Navigational Hazards

When construction of the Industrial Canal commenced, the Dock Board described the canal as a “safety valve” that would effectively be used as a harbor of refuge for vessels during flood events, and predicted that a “great industrial city” would develop along its banks (Industrial Canal 1918). Coincidentally, when the Mississippi River Gulf Outlet (MRGO) navigation channel was first proposed as a means of connecting the Industrial Canal to the Gulf of Mexico in the early 1950’s, the Dock Board stated that the MRGO would spare shipping interests of the navigational hazards associated with entering the mouth of the Mississippi River (Seaway Approval 1951). The MRGO was also later touted for its value in terms of national security: “it will also give this vital port a second route to the sea, which will be of inestimable value in times of national emergency... [It] will provide a vital safety margin” (Channel to Cut 1958). While project boosters pointed to the positive impacts such canals would have on safety during project development, they were later eager to point out the navigational hazards that could arise due to activities that interfered with commerce.

During the Claiborne Avenue bridge/tunnel debate of the early 1950’s, both the Dock Board and the *New Orleans Steamship Association* supported the construction of a tunnel rather than a bridge. Both organizations warned of the navigational hazards that could arise if piers were erected in the Industrial Canal at Claiborne Avenue (St. Claude Avenue Bridge Committee 1953; Biggers 1953). Colonel Garsuad of the Dock Board admitted that ships in the Industrial Canal were “already practically out of control” near the proposed bridge site (St. Claude Avenue Bridge Committee 1953). Dock Board president Harry Harding wrote a letter to the *Louisiana Department of Highways* pointing out that a bridge should not be constructed at Claiborne Avenue, noting that such a project “might impair, restrict or make more hazardous the use of said

Canal” (Hardin 1953) Similarly, C.E Biggers of the New Orleans Steamship Association took the following position:

The navigational hazards for a vessel entering and leaving the Industrial Canal are, at present, beyond what could normally be expected...the navigational hazards of the location of a pier, as in the proposed plans, is highly undesirable- so much so that it would be dangerous to send a vessel into the Industrial Canal” (Biggers 1953).

Later in the 1950’s, when the debate shifted to whether Lower Ninth Ward drawbridges would be closed to vessel traffic in the canal during peak vehicular traffic hours, the United States Army Corps of Engineers (USACE) would weigh-in by stating that “vessel congestion resulting from closed periods creates a serious marine hazard, especially since much of the traffic is in petroleum products” (US Army Corps of Engineers 1957). When questions arose about how the MRGO would be affected by hurricanes, the conversation was again focused on potential threats to navigation and commerce rather than on the safety of area residents. “The engineers now have a nationwide hurricane study underway. They already know that...those jetties at the entrance of the [MRGO] channel would be, have stood up very well against hurricanes” (Progress Report 1959). During this period, potential hazards related to the Industrial Canal (and its MRGO component) were discussed solely in terms of how commercial interests might be impacted, completely ignoring the likelihood of these canals acting as a conductor of storm surge during hurricane events and potentially causing catastrophic flooding in residential areas. Many of the concerns expressed regarding navigational hazards would nonetheless come to fruition

after the construction of the Claiborne Avenue Bridge. However, Lower Ninth Ward residents would unfortunately not be spared the impacts of navigational hazards in the Industrial Canal.

As predicted decades earlier during the Claiborne Avenue bridge/tunnel debate, vessels in the Industrial Canal would begin to pose a threat to the adjacent drawbridges and floodwall. Orleans Levee Board president Guy Lemieux pleaded in 1972 that “action must be taken to remove the abandoned vessels from the canal ‘because each is a potential battering ram which could puncture the protecting levees in case of a hurricane’” (Lemieux Admits 1972). Lemieux also acknowledged that such a collision would undoubtedly flood both the Lower Ninth Ward and St. Bernard Parish. Nearly thirty-five years later, an abandoned vessel would allegedly strike the floodwall and levee in the Lower Ninth Ward during Hurricane Katrina, exacerbating the flooding that was already occurring in the neighborhood at the time.

Figure 7-6:

A barge sits atop a Lower Ninth Ward street following Hurricane Katrina (Landry 2005)



Navigational hazards in the Industrial Canal would become an increasingly salient issue during the 1980's and 1990's. A vessel in the Industrial Canal struck the Florida Avenue Bridge in the Lower Ninth Ward in 1989, and in 1993 a vessel in the Industrial Canal struck the

Claiborne Avenue Bridge, severely injuring two people and killing a pregnant woman (Crippled 72-Year-Old 1989; Turni 1993). In its response to the proposed Industrial Canal lock project, which would also involve widening the Industrial Canal and displacing residents, the Tulane University Law Center compiled some figures regarding the content of vessels travelling in the Industrial Canal. “Industrial chemicals and agricultural chemicals comprised 6.2% (1,598,829 tons) and 2.1% (542,787 tons) respectively of the total lock traffic through the IHNC in 1989” (Tulane University 1999). Additionally, the Tulane Law Center pointed out that after the 1993 Claiborne Avenue Bridge collision, both the USACE and United States Coast Guard were ordered to conduct a study regarding vessel safety in the Industrial Canal and “to implement measures to reduce those hazards” (Tulane University 1999). Six years after the bridge accident, the studies had still not been completed.

Vessels in the Industrial Canal would continue to threaten the safety of Lower Ninth Ward residents following Hurricane Katrina. During Hurricane Gustav (2008), approximately sixty vessels were completely loose in the Industrial Canal, alarming residents who had been victimized by a barge breaking through the Lower Ninth Ward floodwall and levee just three years earlier during Hurricane Katrina (Warner 2008). In an editorial published days later, a resident expressed their dismay:

Vast parts of New Orleans...flirted with catastrophe when dozens of vessels broke loose in the Industrial Canal during Hurricane Gustav. That's a threat that is both unbelievable and intolerable... The firm at the center of the controversy, Southern Scrap Recycling, says it followed a Coast Guard tie-down plan. Yet

between 20 and 30 of the firm's vessels broke loose... (An Intolerable 2008).

Although the construction of the Industrial Canal (and subsequently the MRGO) was proposed as a means of increasing safety and efficiency in navigation and commerce, there were a number of potential hazards related to such projects that had either been completely ignored or discounted by project boosters. As the data indicate, many of said hazards were predictable (and many of them were in fact predicted). However, floods and navigational hazards were not the only means by which the Lower Ninth Ward would be imperiled by the Industrial Canal.

7.3 Health and Safety Hazards

Construction of the Industrial Canal itself caused a number of disturbances to everyday life in the Lower Ninth Ward and created an unsafe environment. In 1920, residents began expressing concerns about the construction project and its impact on a neighborhood school: “This school is practically on the banks of the canal and is surrounded by its various activities...All of these conditions (including cattle driving, construction, and railways) constitute a grave peril to the lives of the scholars” (Residents of 1920). Over a decade after the canal was completed, Mayor Robert Maestri expressed concerns regarding the availability of firefighting and ambulance services in the Lower Ninth Ward (Lighting System 1936; Florida Avenue Bridge 1937).

As the population of the Lower Ninth Ward grew in the early 1950's, Mayor Chep Morrison became concerned with the sewerage and water systems in the neighborhood, publicly admitting that “a dangerous sanitary condition” existed east of the Industrial Canal (Sewerage Soon 1954). During the 1960's, Mayor Morrison received complaints from Lower Ninth Ward residents regarding a wide range of public health and safety issues, including children swimming

and fishing in the Industrial Canal (considered dangerous because of the number of drowning deaths which occurred in the canal and in the MRGO), missing traffic signage and juvenile delinquency (Luke 1961; Two in 1966).

The data suggest that a number of environmental and safety hazards would emerge in the Lower Ninth Ward during the 1970's. A 1971 article addressing white flight in New Orleans claimed that poor quality housing and hazardous environmental conditions were contributing factors to white flight in the Lower Ninth Ward (White Exodus 1971). A survey conducted in 1979 revealed that 88% of Lower Ninth Ward residents thought more police patrols were needed in the neighborhood, and that issues such as illegal dumping and traffic hazards needed to be more squarely addressed (Office of Policy and Planning 1979).

The Lower Ninth Ward would later be subjected to a biological threat that was possibly exacerbated by industrial activity near the Industrial Canal. An encephalitis outbreak spread across twelve states in 1980, including Louisiana. A total of six cases were reported in Orleans Parish, but the Times-Picayune comforted its readers by assuring them that the virus was “mostly contained in the Lower Ninth Ward near the Industrial Canal and St. Claude Avenue” (Encephalitis Cases 1980). Residents in the Holy Cross section of the Lower Ninth Ward would later point out that the *Southern Railway* track bed on St. Claude Avenue had been holding water, thereby contributing to the breeding of mosquitoes in the neighborhood and possibly causing encephalitis to be spread (Gerdes 1982). As of 1983, issues related to the Southern Railway track bed had still not been addressed, and area residents also began expressing concerns about missing and/or damaged railroad crossing signage and eighteen-wheeler traffic down neighborhood streets that were supposed to be marked as “no truck” routes (Gerdes 1983, March; Holy Cross 1983).

The twenty-first century would usher in a set of new health and safety hazards for the Lower Ninth Ward community. In 2000, the City of New Orleans initiated an investigation into illegal dumping in the Lower Ninth Ward and found that its own Sewerage and Water Board had been dumping in the area illegally (Warner 2000). Southern Scrap, a scrapyard business that has been operating on the edge of the Industrial Canal in the Lower Ninth Ward for decades, became the site of a 2006 fire that sent smoke pouring into the neighborhood for days.

Figure 7-7:

A fire rages at Southern Scrap along the Industrial Canal in the Lower Ninth Ward (Haber 2006)

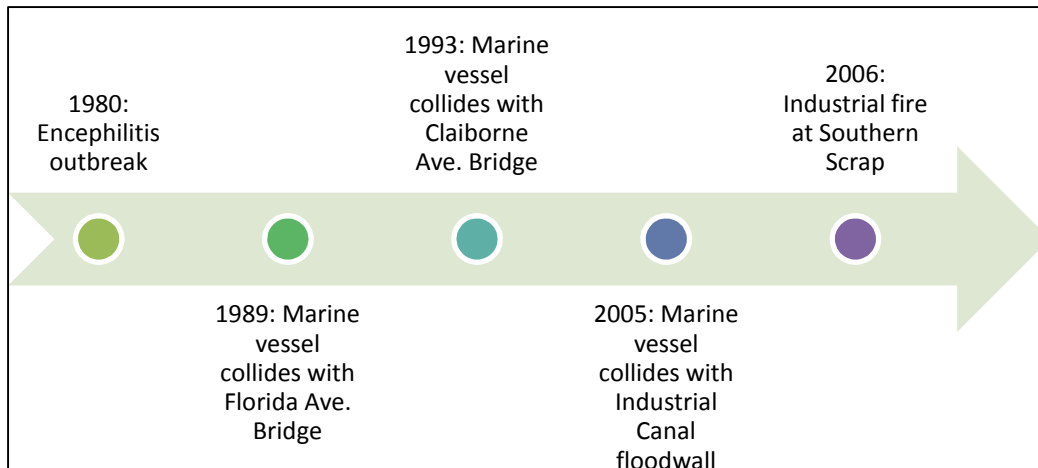


At the time of the fire, the Lower Ninth Ward did not have its own fire station. It was not until 2008 that the neighborhood finally got its first post-Katrina fire station, which would “allow firefighters to respond in less than four minutes to calls from anywhere in the Lower 9th Ward, a section cut off from the rest of the city by the Industrial Canal” (Eggler 2008). Finally, a New Orleans Police Department officer was killed in 2009 when he drove his vehicle off of the Claiborne Avenue Bridge and into the Industrial Canal after a faulty traffic signal failed to notify him that the drawbridge was up (Maggin 2008). In addition to the flood and navigational hazards experienced in the Lower Ninth Ward due to the presence of the Industrial Canal, the neighborhood has experienced a number of other hazards. While environmental hazards,

drowning, automobile accidents, and fires have not been as substantial or sensationalized as the flood events, such instances have impacted quality of life in the neighborhood.

Figure 7-8:

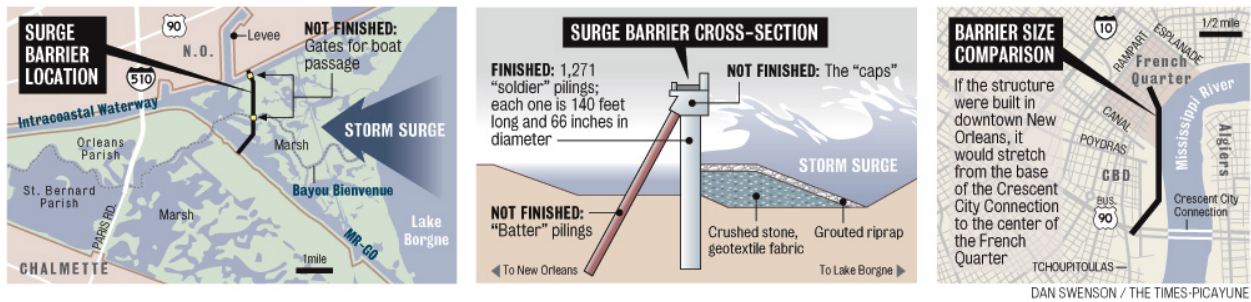
While known for its susceptibility to flooding, the Lower Ninth Ward has experienced a number of other hazards during the past several decades



Although the findings included in this chapter highlight the dangers associated with life in the Lower Ninth Ward over the past century, it is worth noting that significant strides have been made by the United States Army Corps of Engineers, the City of New Orleans, and many others toward mitigating hazards in the Lower Ninth Ward and making the neighborhood more sustainable in the future. Since 2005, over \$14 billion has been spent on an upgraded hurricane protection system that has drastically increased the level of protection in the Lower Ninth Ward (Jervis 2012). While the Industrial Canal and Lower Ninth Ward area had heretofore been considered one of the weakest links in the hurricane protection system, the *Inner Harbor Navigation Canal (Industrial Canal) Surge Barrier* was constructed at a cost of \$1 billion for the purpose of reducing the effects of storm surge in the Industrial Canal (Grissett 2009).

Figure 7-9:

The Inner Harbor Navigation Canal Surge Barrier is a 1.8 mile-long water control structure that was constructed for the purpose of reducing storm surge (Swenson 2009)



The new storm surge barrier was tested on the seventh anniversary of Hurricane Katrina (8/29/2012) when Hurricane Isaac made landfall in southeast Louisiana. Although Hurricane Isaac was not considered a major event, it was accompanied by a significant storm surge that the new barrier handled well. Lower Ninth Ward residents had to cope with the loss of electricity and some minor wind damage, but were spared the horrors of levee and floodwall failure and were able to quickly resume everyday life following Hurricane Isaac (Jervis 2012).

Figure 7-10:

Lower Ninth Ward resident Gloria Guy enjoys a sunny, dry day in the neighborhood following Hurricane Isaac (Jervis 2012)



7.4 Conclusion

Inadequate drainage and minor flooding have historically been common in lower income and African-American neighborhoods (Jackson 1985; Logan and Molotch 1987; Weise

2004). In the case of the Lower Ninth Ward, such minor hazards may have occurred or been prolonged as a result of the neighborhood's isolated location east of the Industrial Canal. However, the significance of the hazards experienced in the Lower Ninth Ward lies in the function of the Industrial Canal as a floodway and the failures of the levee and floodwall that were supposed to protect the neighborhood during hurricane events. Hurricanes Betsy and Katrina were the two most catastrophic hurricanes to strike New Orleans during the second half of the twentieth century, and the Industrial Canal and Lower Ninth Ward were focal points during each event. Narratives pertaining to the intentional destruction of levees and government negligence of levee and artificial waterway construction and maintenance were perpetuated after hurricanes Betsy and Katrina. Such narratives are typical of the "contested discourse and social conflict" associated with natech and technological hazards (Arata et al 2000; Picou et al 2004; Ott 2005; Picou and Marshall 2007; Bevc, Marshall, and Picou 2007; Gunter and Kroll-Smith 2007).

Levee and floodwall failures and/or the construction and maintenance of federal artificial waterways were litigated following hurricanes Betsy and Katrina illustrates the natech and technological character of the events. As several scholars have found, such events typically result in the identification of responsible parties and the emergence of a legal discourse and litigation for the purpose of seeking damages during the recovery period (Picou 1996; Picou et al 2004; Gunter and Kroll-Smith 2007; Picou 2009). The outcomes of such litigation have thus far also been consistent with Picou (2009), who found that "damage claims are deferred through the 'advantages' that corporations and government agencies leverage in the American legal system" (41).

While floods are the most well known hazards to have afflicted the Lower Ninth Ward over the last century, navigational hazards and other similar events relative the presence of the Industrial Canal have also occurred. Although such events are obviously not as significant as hurricanes Betsy and Katrina, they do help distinguish the Industrial Canal from other artificial navigable waterways in the New Orleans area—the Industrial Canal is the only waterway in the system that runs through a residential area and generates these types of risks for residents.

Theorists such as Beck, Giddens, and Lash view risk in the postmodern world as the *manufactured* outcome of the successes of modernity (i.e., capitalism, industrialization, and technological innovation) (Beck 1992; 2009; Giddens 1990). The findings included in this chapter suggest that the construction of the Industrial Canal was an ideal-typical modern feat—the canal was constructed for the purpose of commerce and industry, and the latest canal-building technology was employed in order to maximize its long-term utility. As a product of modernity, the risks associated with the construction of the Industrial Canal (exposure to hazards, specifically) may be viewed in a manner consistent with the views of Beck, Giddens, and Lash: society must now cope with the consequences of the risks it has manufactured. Beck differs with Giddens and Lash in that he believes society is now incapable of coping with the risks it has manufactured. In the case of the Industrial Canal, the performance of the Inner-Harbor Navigation Canal Surge Barrier during Hurricane Isaac supports the views of Giddens and Lash rather than Beck. However, all prior hurricane protection systems along the Industrial Canal have failed at some point.

Beck also differs with Giddens and Lash in that he argues that risk in the postmodern world is global in scale, transcending “traditional social cleavages such as race and class” (Beck 2009, 188). However, Beck’s theory of *world risk society* overlooks the environmental and social

inequities that have perpetuated the disproportionate experience of risks in the lower rungs of society, particularly among minorities and the poor. The findings outlined in this chapter contradict Beck's theory of world risk society—in the case of the Lower Ninth Ward, the consequences of the risks associated with the Industrial Canal have been: (1) highly localized and (2) experienced along traditional societal cleavages such as race and class.

The findings outlined in this chapter support the position of other scholars who have critiqued Beck's world risk society theory, including Alario (1993) and Alario and Freudenberg (2010). These theorists claim "risks have been socially structured, falling predominantly on those without the power or wealth to travel in the first-class sections of society" (Alario and Freudenberg 2010, 2). Their *Titanic* risk theory more accurately describes the Industrial Canal and Lower Ninth Ward case study in that it acknowledges the environmental inequities that exist (Freudenberg, et al 2009; Bullard and Wright 2009; Rivera and Miller 2007; Azcona 2006; Flyvbjerg, et al 2003; Altshuler and Luberoff 2003; Gellert and Lynch 2003; Cole and Foster 2001; Hurley 1995; Bullard 1993; Bryant and Mohai 1992; Logan and Molotch 1987). The inequitable distribution of the risk associated with infrastructure projects is also highlighted in a number of empirical studies cited in Chapter 3 (Flyvbjerg 1998; Flyvbjerg, et al 2003; Altshuler and Luberoff 2003; Freudenburg, et al 2008; 2009; Azcona 2006).

As an infrastructure project constructed for the purpose of furthering commercial interests, the Industrial Canal certainly qualifies as a product of modernity. The consequences (risks) associated with the construction of the Industrial Canal (as experienced in the Lower Ninth Ward) have been described in this chapter. Race and class clearly have a bearing on how risks are distributed throughout society. In the case of the Lower Ninth Ward, the inequitable

distribution of risk (specifically, the risk of flooding) in the neighborhood may not only be viewed as an issue of race and class, but possibly as an issue of environmental justice.

8 Elite Influence, Racialization, and Environmental Justice

As a downriver community on the outskirts of New Orleans, the area that would later become the Lower Ninth Ward was from its earliest days an attractive place for African-Americans and working-class European immigrants to settle (FEMA 2011; Landphair 1999; 2007). While the area was located in a swampy terrain and considered to be marginal long before the Industrial Canal was constructed, the canal served as a wedge that further isolated the Lower Ninth Ward (both spatially and socially) from the rest of New Orleans. The construction of the Industrial Canal was the first of many instances in which the political and business elite would imperil Lower Ninth Ward residents in the name of commerce.

The data suggest that a lack of political empowerment in the Lower Ninth Ward had historically made residents' efforts to improve the neighborhood challenging. However, a tradition of activism amongst Lower Ninth Ward residents emerged in the neighborhood during the first half of the twentieth century, setting the stage for the Lower Ninth Ward to become a center of activity during the civil rights movement. The activism of Lower Ninth Ward African-Americans would later pave the way for public school integration in New Orleans (Landphair 1999). The Lower Ninth Ward would subsequently be selected as one of two sites where public school integration would begin in New Orleans, leading the neighborhood to become a focal point in the Public School Integration Crisis of 1960. The tradition of activism in the Lower Ninth Ward would also prove useful in the 1970's when the neighborhood successfully opposed a proposed project to expand the Industrial Canal locks and thereby displace residents and intensify industrial development along the canal.

Early Lower Ninth Ward residents recall racial harmony in the neighborhood, and many residents' accounts of life in the Lower Ninth Ward stand in sharp contrast to the accounts of

others (Landphair 1999; 2007; Giancarlo 2011). Neighborhood residents tout the Lower Ninth Ward's many suburban characteristics, including its historically high rate of homeownership. Many residents also view the Lower Ninth Ward as a tight-knit, blue-collar neighborhood that was generally safe and family-oriented. Despite such accounts of the Lower Ninth Ward, the neighborhood became a highly racialized and controversial space beginning in the early 1960's when public school integration began. The disproportionate impact that hurricanes Betsy and Katrina would have on the working-class, African-American neighborhood would raise larger questions of race, class and inequality in the vulnerable New Orleans landscape, further intensifying racialization in the Lower Ninth Ward.

8.1 Racialized Roots and Elite Influence

According to geographer Pierce Lewis, the “swampy expanse downriver that ultimately became the Ninth Ward attracted mostly free people of color and immigrant whites” (2003, 51 and 52). Since settlement in New Orleans was largely based on elevation and drainage, the Ninth Ward area provided an affordable alternative to living in the less flood prone, more established areas such as the French Quarter or Uptown (Lewis 2003). Affordable property in the “marginal,” swampy Ninth Ward area attracted thousands of African-Americans during the first half of the nineteenth century (Lewis 1976, 43). The area was officially designated as the Ninth Ward in 1852 and by the 1870's “several African-American benevolent associations and mutual aid societies organized to assist scores of struggling freedmen (formerly-enslaved Africans) in the area” (Landphair 2007, 839; FEMA 2011).

Decades before the construction of the Industrial Canal was authorized, the Ninth Ward had become a diverse working-class community with residents from various parts of the world (Bureau of the US Census 1850). More than 17,000 people resided in the Ninth Ward by 1890

and the population grew to more than 25,000 by 1910 (US Department of the Interior 1896; US Department of Commerce 1913). In the Lower Ninth Ward portion of the area, the population is said to have been 5,500 as of 1910 (Campanella 2009). African-American and white residents alike recalled racial harmony in the neighborhood around the turn of the twentieth century (Landphair 2007, 839). However, the social status and lack of political influence among Ninth Ward residents subjected the neighborhood to municipal neglect, causing the neighborhood to be passed over on many opportunities for sewerage and drainage improvements (Waring 1887).

The Ninth Ward area would first be targeted for industrial development at the turn of the twentieth century. When the State of Louisiana created the Dock Board in 1896, a great deal of power was consolidated into the hands a few local business and political elites (Dabney 1921). This quasi-public governing body made the Industrial Canal project a priority and selected the site of the proposed canal. Construction of the Industrial Canal through the middle of the Ninth Ward (which would create the Lower Ninth Ward on the eastern banks of the canal) was officially approved by the State of Louisiana in 1914.

The Industrial Canal project was from its infancy the product of the political and business elite, as evidenced by comments made by Louisiana Governor Luther Hall in 1916: “Advices received by me during the past few days indicate that the industrial canal long sought by many commercial interests in New Orleans will be realized” (Industrial Canal Work 1916). The Times-Picayune would also publicize the role that political and business elites were playing in constructing the Industrial Canal through the Ninth Ward. In 1918, the publication pointed out that “the men behind the movement are trying to perfect their plans” before publicizing the exact location of the Industrial Canal, but that “businessmen representing the various commercial

exchanges [and] the city government” were working toward “building the canal New Orleans had been dreaming about” (Belt Directions 1918; Industrial Canal 1918, September).

According to the data, the partnerships forged between high-ranking government officials and influential businessmen for the purpose of executing the Industrial Canal project were openly discussed and celebrated. Elite New Orleans businessman Rudolph Hecht, who would later play a vital role in the intentional destruction of the Mississippi River levee at Poydras, Louisiana during the Great Mississippi River Flood of 1927, was also a major Industrial Canal project booster (Barry 1998). Hecht was asked to present plans for the canal to the *Public Belt Railroad* at a meeting arranged by New Orleans Mayor Martin Behrman in 1918 (Belt Directors 1918). When the Industrial Canal was completed in 1923, Hecht would accompany Louisiana Governor John Parker and other political and business elites at a celebration on the first tugboat to enter the canal (Navigation Canal 1923).

Figure 8-1:

Rudolph Hecht and other influential New Orleans businessmen orchestrated the intentional destruction of the levee at Poydras, LA in order to spare commercial interests upriver during the Great Mississippi River Flood of 1927 (US Army Corps of Engineers 1927)



As discussed in Chapter 6, the Industrial Canal drastically changed the landscape of eastern New Orleans and literally created the Lower Ninth Ward neighborhood. Additionally, the canal was the first of three artificial navigational waterways (the others being the Gulf

Intracoastal Waterway and the Mississippi River Gulf Outlet) that formed a network of waterways constructed for the purpose of furthering commercial interests in New Orleans. As Azcona (2006) points out in his study of growth coalitions and artificial waterways in New Orleans, the Dock Board and other commercial interests in the city were ultimately able to “remake the built environment...of the Lower Ninth Ward in the interests of the local aristocracy and at the expense of local residents” (72).

Youngman (2011) also analyzes the longstanding trend of growth coalitions altering the New Orleans environment for the purpose of commerce while generating risks and increasing vulnerability to hazards. While typical responses to hurricanes Betsy and Katrina (including litigation) have involved laying blame on the federal government, Youngman (2011) finds many “factors that implicate the city’s elites of decades gone by in the slow-motion creation of New Orleans’s extraordinary flood vulnerability” (216). Data pertaining to the construction of the Industrial Canal and its impact on the Lower Ninth Ward show the ways in which the actions of local growth coalitions had long-term consequences for area residents.

Lower Ninth Ward whites and African-Americans had already established a tradition of activism by the 1930’s (Landphair 1999; 2007). African-Americans in the neighborhood became active in civil rights issues as early as the 1940’s, focusing on the poor condition of black Lower Ninth Ward schools (Landphair 1999; 2007). City officials first began publicly acknowledging the African-American community in the Lower Ninth Ward in 1954 when Mayor Chep Morrison asked for “patience among the Negroes” in the Lower Ninth Ward while the city worked on making sewerage improvements in the neighborhood (Sewerage Soon 1954). However, racially charged language and imagery regarding the Lower Ninth Ward would intensify as the neighborhood became the center of controversy surrounding the public school integration crisis

of 1960. The Orleans Parish School Board selected two New Orleans public schools for token integration in 1960, both of which were located in the Ninth Ward. McDonough No. 19, located on St. Claude Avenue in the Lower Ninth Ward, was one of the selected schools.

8.2 Public School Integration

Although Lower Ninth Ward residents had initiated litigation regarding public school integration as far back as 1948, integrating public schools in New Orleans was a slow process that took over a decade to begin. The National Association for the Advancement of Colored People (NAACP) supported two major civil rights lawsuits that were originated by Lower Ninth Ward plaintiffs (see Table 8-1). These two lawsuits would later serve as the foundation for public school integration in New Orleans.

Table 8-1:

Two major civil rights lawsuits were originated by Lower Ninth Ward residents with the support of the NAACP, laying the foundation for public school integration in New Orleans (Landphair 2007, 840)

| Year | Case | Subject |
|------|--|--|
| 1948 | <i>Aubert v. Orleans Parish School Board</i> | Challenged inequality in black and white schools |
| 1952 | <i>Bush v. Orleans Parish School Board</i> | Challenged the constitutionality of segregation |

Despite the enormous political pressure to maintain segregated schools in New Orleans, then the largest city in Louisiana, United States District Court Judge J. Skelly Wright moved integration efforts forward. Wright overturned a total of twenty-nine segregationist bills from the Louisiana legislature during his career (Judge James Skelly Wright 2006). After years of resistance and legal haggling, Wright would eventually establish a firm deadline for the Orleans Parish School Board to begin integration. The school board received applications into “whites-only” schools from a total of 136 out of approximately 7,000 African-American first-graders

citywide (Louisiana State Advisory Committee 1961). Applicants were screened using a subjective set of aptitude and social testing methods, and only five female students were selected for entry into white schools (Coles 1967). One student's parents would later remove her name from the list.

It is difficult to ascertain exactly how schools were selected for token integration in New Orleans. According to the Orleans Parish School Board, selection of schools for token integration would be done according to a "scientific plan" (Coles 1967). After two Uptown elementary public school PTAs volunteered to host token integration, the speculation was that at least one of the schools would be selected (Louisiana State Advisory Committee 1961). However, the school board surprisingly opted to select the two Ninth Ward schools. A United States Department of Justice official would later criticize the selection of Frantz and McDonough No. 19:

The worst possible schools were selected to start desegregation. They were in the poorest neighborhoods where bad race relations resulted partly from Negroes displacing white workers by working at lower pay. By having only two desegregated schools, extreme elements could easily focus their hate and pressure tactics; if desegregation had been ordered throughout the school system such tactics would have been much more difficult and much less effective. (Louisiana State Advisory Committee 1961)

The selection of the two Ninth Ward schools seems to have been more political than scientific. A lack of political influence in the working-class Ninth Ward likely made the neighborhood appear to be a location where the school board would experience the least amount

of resistance to integration (Haas 1974). Lower Ninth Ward whites would ultimately view the integration of McDonough No. 19 as a malicious act on the part of the city and yet another example of municipal neglect (Haas 1974; Landphair 2007).

Once initiated, public school integration in New Orleans became an intense showcase of race and class dynamics in the city. Federal agents escorted three African-American female students into the previously “whites-only” McDonough No. 19 in November of 1960. The frightened students were met with “jeers and catcalls” from white parents who stood outside of the school in protest, and many white parents went as far as to remove their children from the school (Police-Guarded 1960). A white Lower Ninth Ward resident made the following statement to a reporter: “The federal government is interfering too much with states’ rights. It’s not a matter of segregation... I’m getting mine [kids] out of there as quick as I can” (Police-Guarded 1960). The Times-Picayune characterized the atmosphere during this period as follows:

For long periods of the day when there was no activity entering or leaving the school building, spirits were kept alive by passing automobiles bearing confederate flags. They were cheered heartily... They were singing, too, mostly ‘The South Shall Rise Again.’ (Police-Guarded 1960)

As protests against integration intensified, at least twelve people were arrested at McDonough No. 19 and Frantz (Rowdiness Marks 1960). Observers at Frantz witnessed a group of white parents calling a Catholic priest a “nigger-lover” for escorting an African-American child to school (Conaway 1973). A number of white students would simply stop attending school at the onset of token integration. Approximately 10,000 out of 38,000 enrolled students were absent from New Orleans public schools after integration began (Rowdiness Marks 1960). Only

twenty (20) of the 467 students enrolled at McDonough No. 19 would attend school during the first day of the crisis (Rowdiness Marks 1960). However, the four children would continue to be escorted into McDonough No. 19 and Frantz each day as part of the school board's efforts to satisfy Judge Skelly Wright's orders.

Figure 8-2:

Gail Etienne, pictured being driven to McDonough No. 19 by federal agents, was one of three African-American students to attend the Lower Ninth Ward school during the New Orleans public school integration crisis of 1960 (Times-Picayune 2010a, November 12)



Media accounts of the public school integration crisis varied during the event and evolved over time. As part of the “McDonough 3” that would spend those first days alone at the Lower Ninth Ward elementary school, Gail Etienne, along with Leona Tate and Tessie Provost, were finally recognized by the Times-Picayune fifty years later for their role in integrating New Orleans's public schools. Etienne, who entered McDonough No. 19 as a first-grader, gave the Times-Picayune an account of her experiences during the integration crisis: "We were all spit upon... I had my dress ripped almost completely off of me. I was hit in the stomach with a baseball bat" (Reckdahl 2010, November).

While Etienne’s recent account of integration at McDonough No. 19 involved violence, the Times-Picayune’s account at the time of the event was much different. The front-page headline on November 16, 1960 read: “12 Persons Arrested, but No Violence Reported.” In contrast, the Times-Picayune placed a number of other racially charged stories on the front page of the paper that same day, including “Four Arrested in Rape Inquiry: Negro Boys Booked in Attack on White Girl” and “Attacker of Woman Gets 15-year Term” (Four Arrested 1960). The latter story was about “A 30-year old Negro accused of raping a white pregnant mother.”

Figure 8-3:

The “McDonough 3” (pictured from left to right, Tessie Provost, Leona Tate and Gail Etienne) are pictured fifty years after the integration crisis. The women recall being physically and verbally abused during the public school integration crisis (Times-Picayune 2010, November 14)



The public school integration crisis had a number of political implications in the New Orleans area. Mayor Chep Morrison was sharply criticized for his handling of the integration crisis (Haas 1974). The mayor tried to separate himself from the situation, maintaining that it while it was his job to maintain law and order in the city, he was not responsible for the actions of the school board (Conaway 1973). Although Morrison’s assessment of his jurisdiction was correct, St. Bernard Parish political figure and white supremacist Leander Perez would not

forego the opportunity to hold the mayor responsible. In a speech delivered to approximately 5,000 people at the New Orleans Municipal Auditorium, Perez would refer to Morrison as “the real culprit, malefactor and double-crosser—the weasel, snake-headed mayor of yours” (Louisiana State Advisory Committee 1961).

Perez and other political figures outside of New Orleans fueled animosity over the public school integration crisis. Perez would also blame the NAACP, “Zionist Jews,” communists and Judge Skelly Wright for the integration crisis (Louisiana State Advisory Committee 1961). There was no shortage of criticism for Wright during and after the crisis. Representative W.K Brown of Grant Parish lambasted Wright on the State house floor in 1960, claiming, “Integration if successful will destroy western civilization... God created the two races. You are no God Skelly Wright. You are not even a competent judge Skelly Wright. You are a traitor to this state” (Gillis and Wagner 1960). Wright and his family, all natives of New Orleans and once part of the exclusive Uptown social scene, would later be excluded from many social circles because of his firm stance on integration (Judge James Skelly Wright 2006).

Perez encouraged white families from the Lower Ninth Ward and other parts of New Orleans to immediately begin sending their children to schools in neighboring St. Bernard Parish. “Don’t wait for your daughters to be raped by these Congolese. Don’t wait until these burr-heads are forced into your schools. Do something about it now!” (Landphair 1999, 59) White families from the Lower Ninth Ward could subsequently be found bussing their children to St. Bernard Parish schools, as illustrated in Figure 8-4.

Figure 8-4:

White parents began to bus their children to schools in St. Bernard Parish after McDonough No. 19 and Frantz Elementary were integrated in 1960 (Times-Picayune (b) 2010, November 12)



Perhaps the greatest political miscalculation on the part of the Orleans Parish School Board when selecting schools for token integration was the proximity of McDonough No. 19 to Perez's St. Bernard Parish. While the process by which the school was selected is unknown, political considerations were likely part of the equation. As previously mentioned, the Lower Ninth Ward and St. Bernard Parish are both isolated from the city of the New Orleans by the Industrial Canal, sharing a border near the Jackson Barracks military base. The possibility exists that the isolated location of the Lower Ninth Ward may have led school board officials to believe that most of the resistance (including public protests) to public school integration could easily be contained east of the Industrial Canal if a majority of the students selected for token integration would first attend McDonough No. 19.

Perez's incendiary remarks regarding the public school integration crisis were not without consequences. Referring to integration as a "total war" that would require whites to use "every weapon at their disposal," Perez incited violence throughout New Orleans (Conaway 1973). Thousands of whites converged on the Central Business District and threw bottles and

bricks (Inger 1969). White mothers could be found protesting outside of McDonough No. 19 and Frantz Elementary every day. The protestors, who became known as “the cheerleaders,” attracted a considerable amount of attention from the media, earning New Orleans a “black eye” on race relations in the opinion of many national observers (Landphair 1999).

The public school integration crisis of 1960 solidified the view of the Lower Ninth Ward as a highly racialized space (Haas 1974; Landphair 1999; 2007). Its reputation as such would only intensify as Hurricane Betsy (1965) struck the Lower Ninth Ward just five years after the public school integration crisis had already altered the social fabric of the neighborhood. By 1970, the white population in the Lower Ninth Ward had decreased by 77% (Office of Policy and Planning 1979).

In the Lower Ninth Ward’s collective memory, Hurricane Betsy was the catalyst that drove remaining whites, already inflamed by school integration, to St. Bernard Parish. The storm also came to symbolize long-standing municipal indifference to the Ninth Ward. The hurricane’s devastation of the Lower Ninth Ward contrasted sharply with minimal damage to the rest of the city, and residents, accustomed to decades of neglect, were certain that officials purposefully blew up the Industrial Canal... (Landphair 2007, 841).

Although the media, residents, and other observers portrayed the isolation of the Lower Ninth Ward as a negative consequence of the Industrial Canal, some neighborhood residents thought they were insulated from the most egregious aspects of segregation in New Orleans. “We did not have to deal with segregation and racism and everything, because we were

insulated” (Giancarlo 2011, 122). The interviewee went on to say “our parents had to cross the Industrial Canal and go to work in the main part of the city, but...none of us children were aware of what our parents had to endure when they crossed over. But that was a silver lining to segregation” (Giancarlo 2011, 123).

8.3 Race, Class, and Hurricane Betsy

While the data suggest that the Lower Ninth Ward was by no means an affluent neighborhood prior to Hurricane Betsy, the racial and socioeconomic makeup of the area became central components of the neighborhood’s image following the event. Prior to Hurricane Betsy, approximately 55% of area residents had less than seven years of schooling; approximately 40% of area residents had annual incomes of less than \$4,000; and approximately 40% of area residents lived in substandard housing (9th Ward Area 1966). However, the Lower Ninth Ward would be portrayed as an *overwhelmingly* distressed neighborhood following Hurricane Betsy, and the data (see Table 8-2 and Table 8-3) suggest that such assessments were accurate (Lower Ninth Ward 1974; Landrieu 1975; Moten 1976; Office of Policy and Planning 1979).

The Lower Ninth Ward became the focus of several urban renewal and community development programs following Hurricane Betsy. After raising money from fellow Lower Ninth Ward residents, Leontine Luke, then president of the Ninth Ward Civic and Improvement League, went to Washington, DC in 1967 “to appeal for improvement on behalf on many Negroes in the area” (Urban Renewal 1967). The worsening of housing conditions for African-American families in the neighborhood following Hurricane Betsy was often discussed, as was the fact that nearly one-half of Lower Ninth Ward families lived in poverty as of 1968 (Plans for 1968). The size of Lower Ninth Ward families and number of welfare recipients in the neighborhood also became focal points for social services programs aimed at addressing poverty in the late 1960’s

(Plans for 1968; Urban Renewal Possible 1969; Improvement Plan 1969; Ninth Ward Renewal 1969).

Controversy erupted over the proposed Industrial Canal lock expansion in 1973, a project that would displace a number of residents and intensify industrial development along the canal, prompting State Representative Theodore Marchand to defend the Lower Ninth Ward by asking that the neighborhood be spared the interruption since it was already considered a “last stop” for people who had been displaced from other neighborhoods in the city (Channel Lock 1973). However, despite such pleas on behalf of the neighborhood, Edward Reed of the Port of New Orleans vehemently defended the lock expansion project in the name of the commercial viability of the port (Channel Lock 1973). Lower Ninth Ward residents would continue to oppose the project for decades to come.

Data collected from the 1970’s indicates the degree to which public agencies and the media began focusing on social conditions in the Lower Ninth Ward following Hurricane Betsy. The New Orleans Office of Policy and Planning reported that the Lower Ninth Ward population was 95.57% African-American as of 1970 and that nearly 71% of all neighborhood residents over the age of twenty-five (25) were either elementary or high school dropouts (Office of Policy and Planning 1979). A 1971 study on property taxation in the Lower Ninth Ward referred to the area as “overwhelmingly black,” and later that year the city was awarded funding in order to address low and moderate income housing and “welfare facilities” in the neighborhood (Gagliano, et al 1971; Improvement Agency 1971).

Community development efforts continued in the Lower Ninth Ward well into the 1970’s and the City of New Orleans devised a community development master plan for the

Lower Ninth Ward in 1974. A number of social indicators in the Lower Ninth Ward were assessed during the planning process.

Table 8-2:

The City of New Orleans identified a number of social vulnerabilities in the Lower Ninth Ward during a master planning process for the neighborhood (City of New Orleans 1974)

| Category | Assessment |
|------------------------------|---|
| Immature Birth Rate | 17%; "Critical"; Worst in New Orleans |
| Blight Index | 1.44; "Very Severe"; 2nd Worst in New Orleans |
| Crowded Housing Units | 50.5%; "Critical"; 4th Worst in New Orleans |
| Low/Moderate Income Families | 66.8%; "Severe"; 7th Worst in New Orleans |

Despite low scores on the assessments outlined in Table 8-2, the Lower Ninth Ward scored high (54.1%) in the City’s assessment of owner-occupied housing units in the neighborhood (Lower Ninth Ward 1974). High rates of homeownership in the Lower Ninth Ward would continue during the decades preceding Hurricane Katrina. One resident could not recall “anyone in the area that I live in that did not own their own property” (Gaincarlo 2011, 121). Another interviewee claimed that the Lower Ninth Ward was “house-proud” and that she thought the neighborhood had one of the highest rates of homeownership in the United States (Gaincarlo 2011, 121).

Subsequent community development grant applications, plans and reports highlighted the high rate of poverty and blighted condition of the Lower Ninth Ward.

Table 8-3:

Data collected throughout the 1970's describes race and class dynamics in the Lower Ninth Ward following public school integration and Hurricane Betsy (City of New Orleans 1975; Mayor Moon Landrieu's Office 1976; Office of Policy and Planning 1979)

| Year | Category | Assessment |
|------|--------------------|---|
| 1975 | Blight | 42% of neighborhood structures in need of "repair or replacement" |
| 1975 | Street Conditions | 53% of neighborhood streets "inadequate" |
| 1976 | Racial Composition | 81-100% African-American neighborhood population |
| 1976 | Income | 21-60% low-income neighborhood population |
| 1979 | Blight | 43% of neighborhood structures considered "deteriorated" |
| 1979 | Income | 60% low-income neighborhood population |
| 1979 | Unemployment | 25% jobless heads of household in the neighborhood |
| 1979 | Poverty | 31% of neighborhood families living below poverty level |

The high rate of owner-occupied housing (69%) in the Lower Ninth Ward was once again noted in 1975 despite the otherwise grim report on social conditions in the neighborhood (Landrieu 1975). However, there does seem to be a discrepancy between the City's figures in 1974 (54.1%) and 1975 (69%).

The federal government officially declared in 1977 that it would not construct a new canal in the predominantly white St. Bernard Parish, and that it would instead move forward with the proposed Industrial Canal lock expansion project (Mongelluzo 1977, May). Shortly thereafter, a group of approximately 250 Lower Ninth Ward residents would lead a protest against the project. One Lower Ninth Ward protestor would make the following statement to a reporter:

You must think the residents of the Ninth Ward are silly...there is nothing in St. Bernard but swamp but because the people in St.

Bernard Parish don't want it, you decide to bring it back to Orleans

Parish. Well, we don't want it either. (Beaulieu 1977, August)

Giancarlo (2011) suggests that “as was also evidenced in the African-American struggles at Love Canal, black community leaders in the Ninth Ward recognized their political power in a post-civil rights era and were prepared to exercise their legal rights” (86).

By 1978, it appeared as though the Industrial Canal lock expansion project was being fast-tracked despite Lower Ninth Ward residents' objections. State representative Thomas Jasper claimed that the federal government had deceived both him and the community over this project, and even insinuated that the selection of the Industrial Canal site was racially motivated (Barbier 1978, August). The *Coalition to Save the Ninth Ward* was a community group formed in 1979 for the purpose of opposing the project and “any current or future plans to expand the Industrial Canal that do not allow neighborhood people the right to determine the future of their neighborhood” (Ward Group 1979). One resident would later state at a public hearing “it is our people who are being moved. It is our people who will suffer. If the shipping company is going to make millions of dollars in our own backyard, then we want to get something out of this canal” (Crosby 1979, May). The project would ultimately be stalled until the 1990's and beyond.

While the data collected from the 1970's suggests that the Lower Ninth Ward would benefit from various community development programs, the long-term benefits of such programs were unclear. A 1986 assessment of community development program performance in the Lower Ninth Ward claimed that while such efforts were successful in reducing physical blight in the area, the City of New Orleans still characterized the neighborhood as being distressed because it “still has a high percentage of low and moderate income families and many of the houses are in need of rehabilitation” (Office of Human Resources 1986). The City proposed a number of

“new” initiatives going forward, including street resurfacing and environmental beautification programs. However, the data suggest that little improved in the Lower Ninth Ward in the two decades leading up to Hurricane Katrina.

The controversy over the proposed Industrial Canal lock expansion project would continue in the 1990’s and beyond. At a 1995 public hearing regarding the controversial project, city Councilwoman Ellen Hazeur-Distance would ask USACE representatives about how the neighborhood could possibly benefit from the project, stating “we don’t own the ships that are going to be using that lock” (Warner 1995, January). A resident would also state to the spirited audience “you are being asked to pay for a superhighway for the rich and the super rich to get richer” (Warner 1995, January).

In 1999, the Tulane University Law Center became involved in opposing the project and distributed a report that highlighted the fact that the Lower Ninth Ward “would be more isolated as a result of this project, and suffer permanent impairment of their police, emergency medical, and fire fighting services” (Tulane University 1999). The report also highlighted some of the existing challenges faced by the neighborhood due to its geographic location and proximity to the canal, including its limited hurricane evacuation routes and lack of transportation options. In a 2000 editorial published by the Times-Picayune, a resident asked the following questions regarding the Industrial Canal lock project: “Who is going to repair the damage to our homes from the expansion of the Industrial Canal? Why can’t the community have true representation in this process?” (Turner 2000) Once estimated to cost \$770 million, the projected cost of the lock expansion project swelled to \$1.3 billion in 2008, and currently remains in limbo (Schleifstein 2008, October).

8.4 Race, Class, and Hurricane Katrina

Although Hurricane Katrina impacted an enormous swath of the Gulf Coast region, New Orleans received most of the media coverage during the event. Coverage pertaining to Katrina's impact on New Orleans's African-American community was particularly salient following the devastating hurricane's landfall, and the Lower Ninth Ward was often the centerpiece of such coverage. Katrina narratives and images conveyed through the media depicted the Lower Ninth Ward in typical fashion—a poor African-American community that had once again been victimized.

Figure 8-5:

A number of African-American women and children are pictured struggling to survive the floodwaters of Katrina in the Lower Ninth Ward (Jackson 2005)



Figure 8-6:

A painting depicts several black corpses floating in the Lower Ninth Ward (Richardson 2007)



Reactions to conditions in the Lower Ninth Ward following Hurricane Katrina were strong. As discussed in Chapter 7, neighborhood lore and personal experience had conditioned many Lower Ninth Ward residents to suspect that some degree of sabotage may have occurred during the Hurricane Katrina. The levee/floodwall system that was supposedly improved following Hurricane Betsy had once again failed and flooded the neighborhood. The barge accident along the Industrial Canal during Hurricane Katrina only further aroused suspicions. “Suspicious about elite intentions gathered steam: Was this an excuse to clean out this poor, overwhelmingly African-American community so that rich white developers could start anew?” (Landphair 2007, 844)

Figure 8-7:

Portrayals of the Lower Ninth Ward during Hurricane Katrina inspired a resurgence of race-based activism in the neighborhood. This protestor stands on the Claiborne Avenue Bridge just above the Industrial Canal floodwall (Associated Press 2010)



On a nationally televised Hurricane Katrina relief fundraiser, African-American rap artist Kanye West would blast the federal government’s response to the hurricane, famously insisting, “George Bush doesn’t care about black people” (de Moraes 2005, September). Instances such as these all fed suspicions of neglect and/or sabotage during Hurricane Katrina, and the Lower Ninth Ward was often portrayed in the media as the victim of longstanding negligence. Eventually, President Bush and his wife Laura would later make several trips to the Lower Ninth Ward to show their support for the neighborhood’s recovery.

Figure 8-8:

George and Laura Bush are pictured praying with African-American students at MLK Elementary School during one of several post-Katrina visits to the Lower Ninth Ward (Young 2007)



Lower Ninth Ward residents were open to discussing their mistrust of the government and skepticism about levee failures during the Katrina event. In an interview conducted by MSNBC at an evacuation shelter in Houston, a Lower Ninth Ward resident told a reporter that she didn't believe that Katrina's impact was "Mother Nature's doing" (Deep distrust 2005). Another interviewee insisted that the Lower Ninth Ward was intentionally flooded in order to save white, more affluent parts of New Orleans. He stated that he did not trust the government when it came to such matters "because this already happened [during Hurricane Betsy]" (Deep distrust 2005). The history of injustice (whether real or perceived) in the Lower Ninth Ward and the displacement of neighborhood residents following Hurricane Katrina created a general sense that the neighborhood had somehow been sacrificed.

Table 8-4:

Demographic changes in the Lower Ninth Ward following Hurricane Katrina (US Census Bureau 2000; American Community Survey 2006-2010)

| Lower Ninth Ward Attribute | 2000 | 2010 | Change (%) |
|-----------------------------------|-------------|-------------|-------------------|
| Population | 14,008 | 2,842 | -80 |
| African-American Population (%) | 98.3 | 95.5 | -2.8 |
| Household Income <\$25k (%) | 60 | 58.1 | -1.9 |
| Population Living in Poverty (%) | 36.4 | 29.1 | -7.3 |
| High School/GED or More (%) | 59.9 | 72.7 | 12.8 |

The data suggest that the neighborhood (although it is currently much smaller) has actually become slightly more affluent since the hurricane. It is estimated that a total of 50,000 impoverished people left Orleans Parish following Hurricane Katrina and that southeast Louisiana has generally seen a decline in the percentage of impoverished individuals over the past several years (Reckdahl 2012, June). Orleans Parish was home to approximately 42% of southeast Louisiana's poor as of 1999, but that figure has now dropped to 31% (Greater New Orleans Community Data Center 2012).

While the Lower Ninth Ward seems to have experienced a slight uptick in its overall socioeconomic status since Hurricane Katrina, neighborhood residents remain acutely aware of the issues of race and class east of the Industrial Canal (Landphair 2007). Furthermore, the Lower Ninth Ward has continued to be a significant *cause celebre* for racial justice in the United States. President Barack Obama, Senator John McCain and Senator John Edwards all campaigned in the Lower Ninth Ward during the 2008 presidential election, and Obama has made several visits to the neighborhood since becoming president. Recovery efforts in the Lower Ninth Ward have become a bellwether for the Katrina recovery *writ large*, and media coverage

of the neighborhood on days such as the anniversary of Hurricane Katrina has become commonplace (McCarthy 2010; Pope 2011).

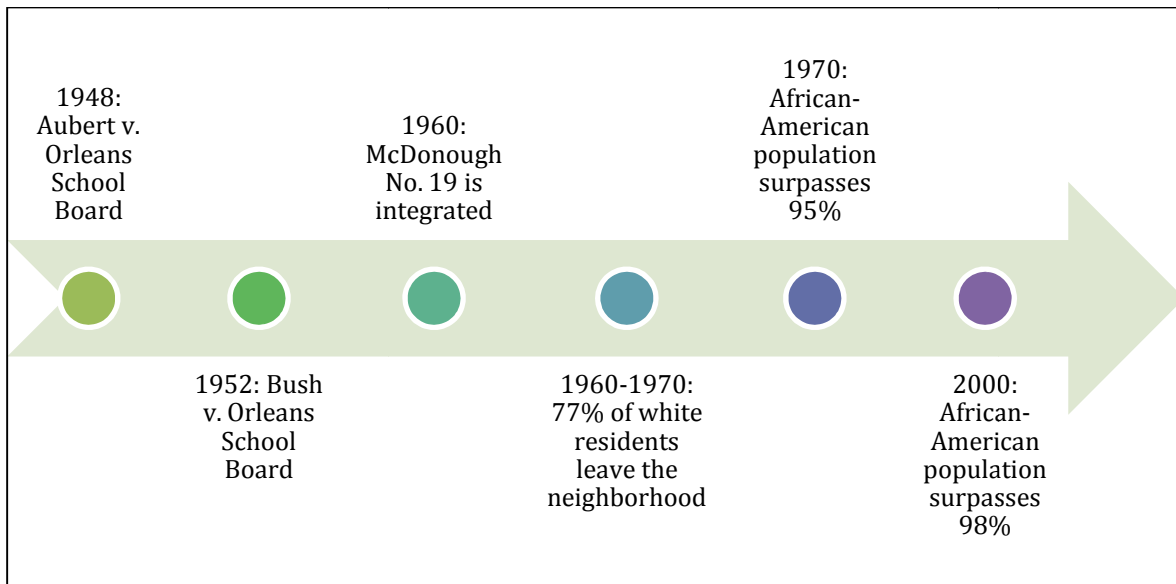
Figure 8-9:

President Barack Obama embraces a number of African-American students at MLK Elementary School in the Lower Ninth Ward (Associated Press 2009)



Figure 8-10:

The Lower Ninth Ward has become an increasingly racialized space throughout the last century



8.5 Conclusion

The area that came to be known as the Lower Ninth Ward was largely rural at the time of the construction of the Industrial Canal, although it had been originally settled by thousands of poor African-Americans and European immigrants between 1810 and 1850 (Landphair 1999, 36). Political and business elites would manipulate the Lower Ninth Ward environment throughout the twentieth century, constructing a network of artificial navigable waterways around the neighborhood and later seeking to intensify industrial development along the Industrial Canal. The longstanding tradition of civic activism in the Lower Ninth Ward would not be for naught, as the neighborhood played a key role in public school integration in New Orleans and would then later successfully oppose the Industrial Canal lock expansion project. The public school integration crisis of 1960 caused the Lower Ninth Ward to become a racialized space, a characteristic that would be highlighted during Hurricane Betsy and widely featured during Hurricane Katrina. The overall character and circumstances of the Lower Ninth Ward ultimately provide a basis for addressing the exacerbation of exposure to natural hazards such as floods as an environmental justice issue.

The findings outlined in this chapter are supported by literature that has found race and class to have a significant bearing on political influence, location of residence, and consequently on the likelihood of exposure to environmental hazards (Freudenburg, et al 2009; Alario and Freudenburg 2008; Sandler and Pezzullo 2007; Flyvbjerg, et al 2003; Altshuler and Luberoff 2003; Azcona 2006; Cole and Foster 2001; Hurley 1995; Bullard 1993; Bryant and Mohai 1992; Logan and Molotch 1987). However, the socioeconomic status of the Lower Ninth Ward appears to be both a cause and consequence of it being selected as the site of the Industrial Canal—a seemingly marginalized and impoverished community grew around the canal, effectively

subjecting even more people to the adverse environmental conditions associated with its presence.

As outlined in Chapter 6, a tradition of activism in the Lower Ninth Ward focused on the provision of municipal services in the neighborhood. This tradition was put into action leading up to the public school integration crisis of 1960, which ultimately created a highly racialized social environment in the neighborhood. Following Hurricane Betsy, social conditions in the Lower Ninth Ward became the focus of public officials and the media alike, further racializing the neighborhood. Although it has been found that “the concerns of such communities are rarely taken seriously in the political process,” the Lower Ninth Ward was able to use its strong tradition of civic activism and the thrust of the larger civil rights movement to invoke environmental justice principles (although the movement had not yet officially started) and thwart the Industrial Canal lock expansion project in the 1970’s (Cole and Foster 2001). This is an excellent early example of a community “integrating environmental justice issues into civil rights agendas,” as described by Bryant and Mohai (1992, 95).

The environmental justice movement began in 1980’s as a crusade by African-Americans in the South against “environmental racism,” but was later expanded to address the poor and other minorities’ struggles against the unequal distribution of environmental hazards throughout the United States (Bullard 1990, 1994; Roberts and Toffolon-Weiss 2001; Cole and Foster 2001; Sandler and Pezzullo 2007). While the Lower Ninth Ward clearly invoked these principles even prior to the movement beginning and into the 1990’s, similar efforts were not made with regard to hurricane protection in the neighborhood leading up to Hurricane Katrina. However, until fairly recently natural hazards have generally failed to gain traction as an issue addressed within the traditional environmental justice framework elsewhere.

Rivera and Miller (2007) have called for more research regarding environmental justice and natural hazards, specifically citing the disproportionate impact Hurricane Katrina had on minorities and the poor. Although largely negative, the media coverage following Hurricane Katrina focused on the Lower Ninth Ward and framed the event in terms of racial justice. Framing the Katrina event in such a way has garnered a significant amount of attention for the Lower Ninth Ward and may have contributed to some of the reinvestment that has been occurring in the neighborhood, including the \$1 billion water control structure that has been designed to protect the Industrial Canal from flooding. The findings outlined in this chapter indicate that framing issues relative to race, class, and the exacerbation of exposure to natural hazards as environmental justice issues may have merit going forward.

9 Conclusion

The purpose of this study is to identify, analyze, and describe the social outcomes that may be affected by the environmental risks generated by infrastructure projects; to examine the ways in which vulnerability and exposure to hazards may increase risk in neighborhoods over time; and to examine the implications of addressing the exacerbation of exposure to natural hazards within the traditional environmental justice framework. This study specifically addresses the following research questions: (1) how has the presence of the Industrial Canal generated environmental risks and affected social outcomes in the Lower Ninth Ward; (2) how has vulnerability and exposure to hazards increased risk and impacted the Lower Ninth Ward over time; and (3) what are the implications of addressing the exacerbation of exposure to natural hazards within the traditional environmental justice framework?

A case study research design was selected for this study, and the Industrial Canal and Lower Ninth Ward were selected as subjects. Over one century of data pertaining to the subjects were collected, including newspaper articles, government reports and correspondence, photographs, maps, and other images. The data were coded, themed, and organized into the three previous chapters. Each chapter was concluded with a set of findings, which will herein be summarized and synthesized in light of the research questions that have been posed. This chapter will conclude with an analysis of the future of the Industrial Canal and Lower Ninth Ward and suggestions for further research.

9.1 Risk and Social Outcomes

How has the presence of the Industrial Canal generated environmental risks and affected social outcomes in the Lower Ninth Ward? Because the Industrial Canal is an infrastructure project that was constructed for the purpose of furthering commercial interests, the

canal certainly qualifies as a product of modernity. As such, the risks generated by the Industrial Canal may be considered consequences of modernity, as described by Giddens (1990) and Beck (1992; 2009). Consistent with Beck's position that modern institutions and society in general are no longer capable of coping with the risks that have been generated, failures in the hurricane protection system (levee and floodwall) along the Industrial Canal have contributed to two catastrophic flood events in the Lower Ninth Ward over the past fifty years. Similarly, other events associated with the various accessory structures and components of the Industrial Canal have introduced the risk of technological hazards such as industrial accidents to the Lower Ninth Ward. As of 2012, it is still unclear as to whether marine vessels in the Industrial Canal can even be properly moored during storm events in order to avoid collision with one the drawbridges or with the protective levee and floodwall itself.

While Giddens (1990) states that science and innovation (also modern institutions) will inevitably develop the expert systems necessary to cope with the risks that have been generated by modernity, the Industrial Canal and Lower Ninth Ward have shown that such systems can actually have the opposite effect. The Industrial Canal and its various accessory structures and components only intensified development (and consequently, risk to life and property) in the Lower Ninth Ward during the first half of the twentieth century. As many as 33,000 people resided in the Lower Ninth Ward throughout its existence, and they relied on "experts systems" such as the levee and floodwall to protect them from the risk of flooding associated with the presence of the Industrial Canal. That those systems failed supports Beck's position that modern institutions and society in general have difficulty coping with the risks that have been generated by modernity and that such modern institutions may be part of the problem.

Although Beck may be accurate in his assessment of society's inability to cope with risk, his view of risk as a class-neutral, dominant social paradigm are challenged by the findings of this study. The distribution of risks associated with Industrial Canal have proven to be largely based on race and class and highly localized, as seen during hurricanes Betsy and Katrina. This is consistent with the Titanic theory of risk set forth by Alario (1993) and Alario and Freudenberg (2010), which essentially states that "risks have been socially structured, falling predominantly on those without the power or wealth to travel in the first-class sections of society" (Alario and Freudenberg 2010, 2). The inequitable distribution of the risk associated with infrastructure projects is highlighted in this study and in previous empirical studies (Flyvbjerg 1998; Flyvbjerg, et al 2003; Altshuler and Luberoff 2003; Freudenburg, et al 2008; 2009; Azcona 2006).

If risks are distributed along the lines of race and class, then those who are *already vulnerable* are the most likely to be impacted, thereby reinforcing and exacerbating the attributes that made them vulnerable to begin with. The Lower Ninth Ward was a working-class, predominantly African-American neighborhood prior to Hurricane Betsy. Following the hurricane, both the minority population and the poverty rate increased considerably. Although deindustrialization, white flight, and suburbanization certainly contributed to these phenomena, Hurricane Betsy seems to have had the effect of expediting these processes by decimating the neighborhood's housing stock and making the neighborhood a more challenging place to live.

Leading up to Hurricane Katrina, the population of the Lower Ninth Ward decreased and the rate of poverty in the neighborhood increased. When Hurricane Katrina struck, the population of the Lower Ninth Ward had declined to just over 14,000 and 36% of all residents were living in poverty (US Census Bureau 2000; Dyson 2006). Nearly 100% of the Lower Ninth Ward housing stock was damaged or destroyed during Hurricane Katrina, and by 2010 the

population had declined to under 3,000, making it the lowest it had been since 1900 (Logan 2006; American Community Survey 2006-2010; Campanella 2009). Overall, hurricanes Betsy and Katrina contributed to the loss of approximately 90% of the population in the Lower Ninth Ward between 1960 and 2010.

While the larger societal changes that occurred between 1960 and 2010 are numerous and would be extremely difficult to measure in terms of their impact on social outcomes in the Lower Ninth Ward, the immediate impacts that hurricanes Betsy and Katrina had on the neighborhood are clear. The Times-Picayune reported that as of 1966 (one year after Hurricane Betsy), nearly 40% of Lower Ninth Ward residents had still not returned to the neighborhood (9th Ward Area 1966). As of 2010 (five years after Hurricane Katrina), 80% of Lower Ninth Ward residents had still not returned to the neighborhood (American Community Survey 2006-2010). At a minimum, the environmental risks generated by infrastructure projects have the capacity to impact social outcomes by displacing those who are affected, thereby altering the lives of the individuals and the social fabric of the neighborhood. In the case of the Lower Ninth Ward, such outcomes are especially profound given the residents' strong attachment to place and historical sense of community.

9.2 Vulnerability, Exposure to Hazards, and Risk

How have vulnerability and exposure to hazards increased risk and impacted the Lower Ninth Ward over time? As described in the previous section, risk is distributed along the lines of race and class and can have a profound impact on social outcomes. Since race and class are inextricably linked to social vulnerability, the assignment of risk is not only based on vulnerability, but may also contribute to further vulnerability. Whether or not risk exacerbates vulnerability depends on the frequency and scope of hazard events—the circular relationship

between risk and vulnerability manifests itself in the form of hazard events such as hurricanes Betsy and Katrina.

According to Sen (1981); Pelling (2003); Cutter, et al (2003); and Beck (2009), vulnerability is the product of political and economic marginality and inequality, and is characterized by an inability to cope with risk and uncertainty. The selection of the Ninth Ward area as the location for the Industrial Canal speaks to the vulnerability of the community at that time. At the turn of the twentieth century, poor African-Americans and European immigrants who did not have the access to the political and economic assets that would have been required to thwart the Industrial Canal project largely inhabited the area. Since its construction, the Industrial Canal (in addition to functioning as a floodway) has functioned as a physical barrier between the Lower Ninth Ward and the rest of New Orleans. Additionally, a number of accessory structures (drawbridges, levee, and floodwall) and other navigation canals (Gulf Intracoastal Waterway and Mississippi River Gulf Outlet) relative to the Industrial Canal have intensified the isolation of the Lower Ninth Ward, contributing to a pattern of municipal neglect.

Isolation is a dominant characteristic of distressed communities (Wacquant 2008; Dyson 2006; Freeman 2006; Marcuse 1997; Logan and Molotch 1987). Cole and Foster (2001) have found that spatial segregation and isolation strong indicators of racial inequality in society. However, it is worth noting that the findings of this study have indicated that there is an appreciation among some Lower Ninth Ward residents for the neighborhood's geographic location, which heightens their sense of independence and solidarity and has historically insulated residents from the negative aspects of life on the other side of the Industrial Canal. The geographic location of the Lower Ninth Ward is also attractive to neighborhood residents who espouse the values of homeownership and suburban life.

While lapses in the provision of municipal services in distressed communities have historically been common throughout the United States (Weise 2004), this phenomenon has been especially consequential in the Lower Ninth Ward given its geographic location and reliance on hurricane protection systems such as levees (physical vulnerability). Leading up to Hurricane Betsy, the Lower Ninth Ward generally lacked the political and economic assets to improve quality of life in the neighborhood. Following Hurricane Betsy, the neighborhood's political and economic assets were further diminished, thereby increasing its level of vulnerability—80% of the neighborhood had been flooded, causing a major interruption to life in the Lower Ninth Ward and prompting residents to expend resources to either rebuild or relocate (Dyson 2006). Unlike during Hurricane Katrina, the National Flood Insurance Program and other similar resources did not exist when Hurricane Betsy struck, forcing residents to be more personally accountable for recovery efforts.

During the decades between hurricanes Betsy and Katrina, isolation and lapses in municipal services persisted in the Lower Ninth Ward. Most importantly, adequate hurricane protection had still not been provided to the neighborhood. According to Chambers (1989), vulnerability is magnified over time by exposure to hazards. “In cities the ratchet effect will be generated and felt by people having to live with multiple risk types—crime and violence, disease, unemployment, pollution and technological hazard—as well as environmental hazard” (Pelling 2003, 16). The myriad risks described by Chambers all existed in the Lower Ninth Ward leading up to Hurricane Katrina, ultimately making the neighborhood more vulnerable by the time the hurricane struck. As mentioned in the previous section, Hurricane Katrina devastated the Lower Ninth Ward, damaging or destroying virtually 100% of the housing stock and forcing residents to relocate for prolonged periods of time. Eighty percent of Lower Ninth Ward

residents had not returned to the neighborhood as of 2010 (American Community Survey 2006-2010).

Vulnerability and exposure to hazards can increase risk and impact a neighborhood over time by setting in motion a pattern of exposure to risk (already dictated by level of vulnerability); increased vulnerability (a consequence of experienced hazards); and the experience of future hazards (where risk and vulnerability converge yet again). In the case of the Industrial Canal and Lower Ninth Ward, this pattern appears to have at least temporarily been broken due to the recent investments that have been made in improving hurricane protection apparatus around the neighborhood and the construction of more sustainable forms of housing (thereby reducing future risk). Additionally, victims of Hurricane Katrina had more opportunities to be compensated for their losses (such as the National Flood Insurance Program and Road Home) than did victims of Hurricane Betsy (thereby reducing future vulnerability).

9.3 Natural Hazards and the Environmental Justice Movement

What are the implications of addressing the exacerbation of exposure to natural hazards within the traditional environmental justice framework? This study has shown that many of the same structural inequities that cause poor and minority populations to be disproportionately exposed to “traditional” or technological environmental hazards such as pollution or hazardous waste may also exacerbate exposure to natural hazards such as floods. Additionally, poor and minority neighborhoods may also have a strong tradition of activism that can be utilized as a tool to address the exacerbation of exposure to hazards within the environmental justice framework. According to Bryant and Mohai (1992), African-Americans entered the environmental justice movement in the 1980’s on the strength of “integrating environmental justice issues into civil rights agendas” (95).

There are many parallels between traditional environmental justice issues and exposure to natural hazards. The most common thread in each instance is that exposure can often be imposed by industry (with state support) and other human-caused, technological activities. While such exposure is inherently *environmental* in nature, *justice* must become a consideration in such instances given that minorities and the poor are more likely to experience the brunt of the exposure. As several previous empirical studies have found, the poor and minorities have historically been relegated to less desirable locales and *zones of sacrifice* (Freudenberg, et al 2009; Bullard and Wright 2009; Freudenberg 2008; Azcona 2006; Altschuler and Luberoff 2003; Cutter 2003; Flyvbjerg, et al 2003; Pelling 2003; Heinz Center 2002; Cole and Foster 2001; Heinz Center 2000; Hurley 1995; Bullard 1993; Bryant and Mohai 1992; Logan and Molotch 1987).

In his study of race and the environment in Gary, Indiana, Hurley (1995) found that:

Relegated to the lowest levels of the urban-industrial hierarchy and systematically accorded lowest priority in the distribution of environmental amenities, African-Americans had always understood their environmental dilemma in terms of broader structural inequities. (112)

Rivera and Miller (2007) argue that racial inequity and hazards such as floods should be given more consideration in the environmental justice movement. The authors use evidence from a number of case studies to illustrate the argument that hazards have “set in motion patterns of change not only to the physical landscapes but also to the demographic and cultural environments” in the African-American community (Rivera and Miller 2007, 503). The Industrial Canal and Lower Ninth Ward case study builds on the above argument by illustrating

the ways in which the Lower Ninth Ward has been altered by the hazards associated with the Industrial Canal.

The Lower Ninth Ward established a tradition of civic activism from its earliest days, leading the neighborhood to play a central role in public school integration in New Orleans and to successfully thwart the Industrial Canal lock expansion project in the 1970's. Although the environmental justice movement had technically not begun when the Lower Ninth Ward began its fight against the project, the neighborhood successfully invoked many of the principles of the environmental justice movement during this process. Unfortunately, Lower Ninth Ward residents did not approach increased hurricane protection with the same vigor leading up to Hurricane Katrina. Nonetheless, their opposition to the lock expansion project was an early example of environmental justice principles at work in an African-American community, and can be similarly applied to efforts to address natural hazards in the Lower Ninth Ward and elsewhere.

Addressing hazards within the environmental justice framework shows a great deal of potential in the future. Where appropriate, framing issues relative to natural hazards as matters of justice and articulating the social consequences of not mitigating such hazards can be an excellent way of educating stakeholders and lobbying for resources. The possibility exists that if awareness regarding exposure to natural hazards is properly promoted, the topic could someday gain the mainstream notoriety that recycling and "green" technology have gained over the past several decades.

9.4 The Future of the Lower Ninth Ward

Over seven years after Hurricane Katrina, the Lower Ninth Ward continues to be largely uninhabited. Many early twentieth century perceptions pertaining to the remoteness of the neighborhood now appear to have become reality, and much of the public infrastructure (such as

roads, drainage systems, and water and sewerage apparatus) that generations of Lower Ninth Ward residents struggled to obtain for the neighborhood over the past century is now abandoned and/or in disrepair. The population of the Lower Ninth Ward is currently the lowest it has been in over one hundred years.

Social networks in the tight-knit Lower Ninth Ward were interrupted after Hurricane Katrina, as over 10,000 fewer residents live in the neighborhood than before the event. While the homeownership rate in the neighborhood continues to hover above 60%, there are simply fewer homeowners to advocate on behalf of the neighborhood than in the past. The struggle for better schools in the Lower Ninth Ward began in the 1920's and reached its climax in the late 1940's and early 1950's when neighborhood residents began to legally challenge the constitutionality of segregation. Despite these efforts, school administrators and Lower Ninth Ward residents had to struggle in order to reopen a single school in the neighborhood following Hurricane Katrina (Giancarlo 2011).

The challenges associated with the depopulation of the Lower Ninth Ward following Hurricane Katrina are counterbalanced by attention the neighborhood has received since the event. Public investments in the Lower Ninth Ward such as corridor improvement projects and increased hurricane protection speak to public officials' commitment to fostering future growth in the neighborhood. Similarly, private investments such as Brad Pitt's *Make it Right* project have given many residents a means of returning and many observers a reason to continue paying attention to the Lower Ninth Ward recovery.

Figure 9-1:

The Make it Right Foundation displayed pink boxes around the Lower Ninth Ward in order to express their vision for future development along the Industrial Canal (Grant 2007)



As with other more established New Orleans neighborhoods, Lower Ninth Ward residents and observers seem to have a renewed interest in the history of the neighborhood. A historical marker was placed at the site of the former McDonough No. 19 fifty years after the school was one of the first in New Orleans to be integrated (Reckdahl 2010, November). However, the school (now named in honor of Louis Armstrong) has been shuttered since Hurricane Katrina and residents continue to struggle to have the school rehabilitated. “There has been disenfranchisement here for decades and we will never get representation if we don’t fight...The city of New Orleans needs to be ashamed of itself,” said one resident at a recent protest in front of the school (Flom 2012). Unfortunately, hurricanes are also a major part of Lower Ninth Ward history, and have been memorialized on Claiborne Avenue near the Industrial Canal. Many residents would still prefer to see more commercial investment in the

neighborhood: “People come down here and take pictures but that doesn’t bring any money” (Flom 2012).

Figure 9-2:

The futuristic design of Make it Right Foundation homes has significantly changed the appearance of parts of the Lower Ninth Ward (Morphosis Architects 2009)



In terms of risk, vulnerability, and hazards, the future of the neighborhood is unclear. As Beck has stated, modern institutions have played a major role in generating risks in contemporary society, and is now seemingly incapable of mitigating said risks (Beck 1992; 2009). Given the history of the Industrial Canal and hurricane protection in the Lower Ninth Ward, it is fair to ask whether the new, upgraded hurricane protection system will perform any better than the last one. Perhaps more importantly, will the new hurricane protection system foster development in the Lower Ninth Ward and reproduce the cycle of risk, vulnerability, and exposure to hazards that has been discussed in this study? The risks associated with the presence and location of the Industrial Canal and its components have been discussed at length in this study. The coastal location of the Lower Ninth Ward makes the neighborhood vulnerable to

natural hazards such as hurricanes and floods, and the Industrial Canal and its components introduce the added risks of natech disasters (caused by a combination of natural events and the technological, built environment) and technological hazards (caused solely by the presence of the Industrial Canal, such as an industrial accident). The social vulnerability of the Lower Ninth Ward only compounds the severity of how such events might impact the neighborhood in the future.

For the time being, the Lower Ninth Ward must rely on modern institutions (science, innovation, the state, and flood insurance) as a means of protecting them from future catastrophe. The Industrial Canal is a permanent fixture in the neighborhood landscape and the Industrial Canal lock expansion project is still being considered nearly forty years after it was first introduced. However, the findings of this study indicate that modern institutions are not only suspect in terms of protecting society from risks, but that they are also incapable of restoring the social fabric of neighborhoods. Minimizing the future risks associated with the Industrial Canal and preserving what remains of the Lower Ninth Ward social fabric may require a *subpolitical* approach, as Beck has suggested (Beck 2009). Framing issues relative to risk in the Lower Ninth Ward and elsewhere as issues of *social justice* might be accomplished within the traditional environmental justice framework or through some other vehicle that exists outside of modern institutions.

9.5 Further Research

The findings of this study may be supplemented by further research that incorporates the collection of other forms of data and employs other research methods. The data collected for this case study consisted primarily of newspaper articles, public documents, and images. Given the limited time and resources available for the completion of the study, many other forms of

data and research methods were not utilized. Collection of more quantitative data (such as census data, flood insurance claim statistics, and crime statistics) would enhance the findings of this study and provide more opportunities for data triangulation. Likewise, interviews with Lower Ninth Ward residents (both current and past) would also enhance the findings of this study and provide for a more textured analysis.

In terms of the Industrial Canal and Lower Ninth Ward, there are many interesting facets of this case study that are worthy of further exploration. First and foremost, the notion that levee and floodwall failures along the banks of the Industrial Canal were done intentionally as a means of flooding the Lower Ninth Ward and sparing more affluent parts of New Orleans is an interesting concept that has heretofore not been addressed in the literature. Such an endeavor would require a survey of the literature regarding victimization and hazards, and extensive interviewing of Lower Ninth Ward residents (past and present).

The “renaissance” of the Lower Ninth Ward over the last few years would also provide for an interesting case study regarding disaster recovery and resilience. Although the Lower Ninth Ward still has a long way to go, there are many things occurring in and around the neighborhood that indicate recovery and growth. Given the demographics of the Lower Ninth Ward, opportunities for comparative analyses with other more affluent neighborhoods in New Orleans may prove to be a worthwhile research endeavor.

Finally, the concept of including the exacerbation of exposure to natural hazards such as floods as a mainstream environmental justice issue is worthy of further inquiry. While the “green” movement and other environmental initiatives have gained popularity in the United States over the last decade, exposure to hazards such as floods seems to be a promising new

frontier for researchers to generate awareness regarding why certain neighborhoods are more prone to hazards than others and what the social consequences of such hazards might be.

On a broader scale, there are many opportunities for further research on vulnerability, exposure to hazards, and risk. Neighborhoods around the world continue to live with risk, and the most vulnerable populations are the most likely to be significantly impacted by hazard events. Whether imposed by infrastructure projects or other activities of industry and the state, opportunities abound for comparative analyses of how risk, vulnerability, and hazards affect neighborhoods in the short- and long-term.

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