

**HOUSEHOLD RESIDENTIAL DECISION-MAKING IN THE WAKE OF
DISASTER
CASES FROM HURRICANE SANDY**

by

Alex Greer

A dissertation submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Disaster Science and Management

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DISASTER
CASES FROM HURRICANE SANDY**

by

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TABLE OF CONTENTS

LIST OF TABLES	xv
LIST OF FIGURES	xvii
ABSTRACT	xviii

Chapter

1 INTRODUCTION	1
2 LITERATURE REVIEW	6
Cutting Through the Concepts and Constructs	6
Characterization of the Literature	9
Selected studies outside the U.S. context	10
Selected studies within the U.S. context	11
Applicability of international literature	16
Models of the Resettlement Process	18
Scudder and Colson model of resettlement	18
Impoverishment risks and livelihood reconstruction model	21
Push-pull model	22
Models of the risks of resettlement	25
What Do We Know About Decision-Making After a Disaster?	27
Propensity to rebuild in the same spot	27
Attachment to place	30
Destruction of the built environment	32
Income, access to resources, and minority status	34
Risk perception	36
Pre-existing conditions	39
Miscellaneous indicators	41
What Can We Learn From Case Studies?	42
Successes and failures	43

	Community engagement.....	44
	Planning.....	47
	Housing.....	49
	Financial incentives	51
	What is Missing?	53
3	METHODS.....	56
	Case Study Methodology	56
	Data Collection Techniques	59
	Policy review	61
	Questionnaires	62
	Analysis plan	72
	Data management.....	72
	SPSS analysis	72
	Methods to ensure quantitative data quality	76
	Semi-structured interviews.....	77
	Interviews with residents.....	78
	Interviews with policymakers.....	84
	Instruments and tactics.	85
	Analysis plan	87
	Expected data.....	87
	Content analysis.....	87
	Process.....	88
	Methods to ensure qualitative data quality.....	94
	Case Studies.....	95
	Prime Hook.....	95
	Oakwood Beach, NY.....	98
	General history	98
	Geographic setting.....	99
	Demographics.....	101
	Disaster history.	102
	Hurricane Sandy.	103
	Impacts.	103

	Buyout.....	104
	Sea Bright, NJ.....	105
	General history.....	105
	Geographic setting.....	106
	Demographics.....	109
	Disaster history.....	110
	Hurricane Sandy.....	111
4	POLICY REVIEW.....	113
	Housing Recovery Policy.....	114
	Roles and Responsibilities.....	116
	Policies and Programs.....	121
	Strategies and Frameworks.....	123
	National Disaster Recovery Framework.....	123
	National Disaster Housing Strategy.....	125
	Policies Creating and Reinforcing Markets.....	127
	National Flood Insurance Program.....	127
	Loans.....	130
	Distributive Policies.....	131
	The Hazard Mitigation Grant Program.....	131
	Community Development Block Grants – Disaster Recovery.....	133
	Public and Individual Assistance.....	135
	Discussion - Recovery from Sandy.....	136
	Federal response.....	136
	New Jersey.....	138
	New York.....	140
	Conclusions.....	142
5	ANALYSIS, FINDINGS, AND DISCUSSION.....	144
	Data Reduction and Manipulation.....	146
	Factor analysis.....	146

Recoding.....	147
Univariate distribution and manipulation of dependent variables.....	149
Qualitative Coding.....	152
Affective Relation to Place.....	155
Attachment to place	155
Quantitative analysis	156
Qualitative analysis - questionnaire data	160
Interviews	162
Risk Perception.....	169
Quantitative analysis	169
Qualitative analysis - questionnaire data	175
Interviews	176
Trustworthiness	182
Quantitative analysis	182
Qualitative analysis - questionnaire data	184
Interviews	185
Discussion.....	186
Attachment to place	186
Risk perception.....	189
Trustworthiness	191
Functioning.....	193
Pre-event.....	193
Quantitative analysis - race and sex	194
Quantitative analysis - age and household composition	195
Qualitative analysis - questionnaire data	198
Policies and plans	199
Qualitative analysis - questionnaire data	200
Paperwork and a long process.	201

Confusion	202
Positive assessments.....	206
Interviews	207
Resettlement program.....	207
Paperwork.....	208
Confusion	210
Adaptation.	211
Order of incentives	213
Coverage.....	215
Resources.....	217
Quantitative analysis - buyout offer	218
Quantitative analysis - household income	220
Quantitative analysis - NGO support	223
Quantitative analysis - affordable housing	225
Quantitative analysis - incentives.....	227
Quantitative analysis - buyout offer - questionnaire data	230
Interviews - buyout offer	233
Qualitative analysis - NGO support - questionnaire data	236
Interviews - NGO support offer	238
Qualitative analysis - affordable housing - questionnaire data.....	239
Interviews - affordable housing.....	241
Impacts	244
Quantitative analysis - damage and disruption.....	244
Qualitative analysis - damage and disruption - questionnaire data.....	252
Interviews - damage and disruption	254
Qualitative analysis - stress - questionnaire data.....	256
Interviews - stress	257
Qualitative analysis - post-Sandy experiences	259
Discussion.....	267
Functioning.....	267
Policies and plans	269
Resources.....	272

	Impacts	280
6	CONCLUSIONS	285
	Contributions	286
	Major findings	286
	The anchoring effect.....	289
	Variable policies and a convoluted process.....	290
	Planning for recovery	293
	Limitations.....	295
	Future Research	296
	REFERENCES	298
Appendix		
A.	ACRONYMS	329
B.	INTERVIEW GUIDE FOR RESIDENTS	331
C.	INTERVIEW GUIDE FOR POLICYMAKERS.....	333
D.	CASE STUDY RAW DATA	336
E.	IRB PROTOCOL	354
F.	COMMUNITY CENSUS PROFILES	355
G.	MAPS OF STUDY SITES	358
H.	RECRUITMENT MATERIALS.....	360
I.	NEW YORK INTERVIEW REJECTION	364
J.	PRE- AND POST-BEST AND WORST FOCUSED CODE WORDLES	365
K.	PROCESS AND PITFALLS FOCUSED CODES.....	369
L.	INTERVIEW PATTERN CODES.....	374
M.	OAKWOOD BEACH QUESTIONNAIRE	377

N. SEA BRIGHT QUESTIONNAIRE 391

LIST OF TABLES

Table 1	Selected Studies Outside the U.S. Context.....	11
Table 2	Selected Studies Within the U.S. Context.....	15
Table 3	Miscellaneous Factors That May Affect Resettlement Decision-Making	42
Table 4	Propositions From the Literature Review	54
Table 5	Postcard and Questionnaire Mailing Schedule and Return Rate.....	65
Table 6	Questionnaire Structure.....	67
Table 7	Residential Status of Interviewees in Sea Bright	81
Table 8	Deductive Codes Developed From the Literature Review.....	91
Table 9	Policies Guiding U.S. Housing Recovery	123
Table 10	Univariate Distribution of Dependent Variables.....	151
Table 11	Univariate Distribution of Recoded Questions Regarding Attachment to Place	156
Table 12	Bivariate Analysis of Indexed Attachment Variable.....	159
Table 13	Univariate Distribution of Recoded Questions Regarding Risk Perception	170
Table 14	Bivariate Analysis of Buyout Decision.....	174
Table 15	Univariate Distribution of Questions Related to Trustworthiness	183
Table 16	Univariate Distribution of Race and Gender.....	195
Table 17	Univariate Distribution of Age, Household Composition, and Education Level	197

Table 18 Univariate Distribution of Buyout Offer and Decision for Oakwood Beach Respondents.....	219
Table 19 Bivariate Analysis of Buyout Offer.....	220
Table 20 Univariate Distribution of Income Pre- and Post-Hurricane Sandy	222
Table 21 Univariate Distribution of the Perceived Importance of Help From NGOs in the Residential Decision-Making Process	224
Table 22 Bivariate Analysis of the Importance of Help from Non-Governmental Organizations.....	225
Table 23 Univariate Distribution of the Perceived Importance of Access to Affordable Housing and Going Into Debt in the Residential Decision-Making Process	226
Table 24 Univariate Distribution of the Perceived Importance of Financial Incentives in the Residential Decision-Making Process	229
Table 25 Bivariate Analysis of the Importance of Incentives to Rebuild In Situ.....	230
Table 26 Reported Damage to Home, Community, and Disruption to Travel.....	247
Table 27 Bivariate Analysis of Damage to Home	249
Table 28 Bivariate Analysis of Length of Disruption Within Community	251
Table 29 Bivariate Analysis of Ability to Travel Within Community	252
Table 30 Changes in Post-Best and Worst for Oakwood Beach	260
Table 31 Changes in Post-Best and Worst for Sea Bright.....	262
Table 32 Summary of Findings	287
Table 33 Acronyms	329
Table 34 Case Study Raw Data	336
Table 35 Community Census Profiles	355

LIST OF FIGURES

Figure 1	Scudder and Colson Model of Resettlement (1982)	20
Figure 2	Concurrent Triangulation Design	61
Figure 3	Map of Mailing Area for Oakwood Beach	63
Figure 4	Staten Island, Oakwood Beach, Census Tract 128.05, and the Buyout Zone	100
Figure 5	Three Parts of Oakwood, Staten Island	101
Figure 6	Map of Sea Bright, New Jersey	108
Figure 7	Typical Housing Recovery Process in Sea Bright As Described in Process and Pitfalls Questions	265
Figure 8	Oakwood Damages	358
Figure 9	Sea Bright Damages	359
Figure 10	Pre-Best Wordle	365
Figure 11	Post-Best Wordle	366
Figure 12	Pre-Worst Wordle	367
Figure 13	Post-Worst Wordle	368
Figure 14	Process and Pitfalls Focused Codes	369
Figure 15	Interview Pattern Codes	374

ABSTRACT

This dissertation explores how households decide to relocate and resettle or rebuild in situ following a disaster. Recent disasters, catastrophes, and episodes of repeat losses have started a conversation regarding the efficacy and desirability of an “organized retreat” from hazardous zones. The disaster literature, however, has lagged in this area, and we do not have a broad understanding of relocation and resettlement, or post-disaster household decision-making. Most scholarship in this area only tangentially relates to longer-term residential decision-making, or merely offers “best practice” recommendations for managing resettlement efforts. This study uses case-study methodology to investigate household residential decision-making in two communities in the wake of Hurricane Sandy. Using two-tailed sampling of extreme cases, this study examines Sea Bright, NJ, a community that is rebuilding in situ, and Oakwood, NY, a community that is relocating and ultimately resettling.

I used a mixed methods approach to build the case studies, including a survey distributed to the entire study population, purposely-sampled semi-structured interviews with community members and policymakers, and a review of housing recovery policies. Findings from this exploratory study suggest pre-event functioning,

attachment to place, risk perception, destruction of the built environment, incentives, the availability of buyouts, and post-event functioning influenced household decision-making process. Mixed evidence supports the role of perceptions of trustworthiness of officials and NGO support. Interestingly, I did not find support for variables other studies identified as important in the decision-making process, including household income, race, or dependents in the home. This study also adds nuance to the literature by parsing constructs into their components and exploring how they relate to the decision-making process. The results of this study provide a preliminary understanding of how households decide where they live after a disaster. In achieving this goal, this study offers policymakers unique insights on what households consider most important in this decision-making process. Through a detailed explanation of methods and any problems encountered, this project also serves as a model for replication to confirm or expand findings through future studies.

Chapter 1

INTRODUCTION

We live on an island surrounded by a sea of ignorance. As our island of knowledge grows, so does the shore of our ignorance.

- John Archibald Wheeler

According to Oliver-Smith (1996), disasters clearly show a societal failure to adapt to some element(s) of their surrounding natural and social environments.

Disasters, then, challenge the way society organizes itself and cause those responsible for its protection to reconsider the safety measures they rely on. In order to address the vulnerabilities disasters expose, key stakeholders in communities must decide what changes to make to reduce community vulnerability to an acceptable level. At the same time, households are making many of the same decisions either with or without considering the changes the larger community is assessing. While discussing floodplain management, Perry and Mushkatel (1984:155) state that there are three ways to manage a hazard: change the hazard through structural mitigation, minimize losses through insurance and timely evacuation, or permanently move people away from a hazardous zone.

Due to recent catastrophes and disasters such as the Indian Ocean Tsunami, Hurricane Katrina, and Hurricane Sandy, policymakers, researchers, and the media are all devoting more attention to the recovery phase of disaster management, specifically whether relocation and eventual resettlement is a better option than rebuilding in situ.

Disaster research, however, has not developed an extensive understanding of post-disaster recovery or, specifically, relocation and resettlement. Most scholars agree that the first studies of disaster recovery at the community level started with J. Eugene Haas in the late 1970s, and began to receive more attention by the mid-1980s (Olshansky 2005; Quarantelli 1999). Even with increased attention, numerous researchers note the recovery phase as the least-understood phase of the disaster cycle (Berke, Kartez and Wenger 1993; Bevington *et al.* 2011; Mileti 1999; Olshansky 2005; Nigg 1995; Rubin; Saperstein and Barbee 1985; Rubin 2009; Smith and Wenger 2007:234).

The relocation and resettlement literature is also meager. Most studies exploring relocation and resettlement studies either focus on forced resettlement of communities outside the U.S. or more short-term sheltering issues within the U.S. (Oliver-Smith 1991; Sastry 2009). Limited research within the U.S. focuses on relocation and resettlement, and most studies only discuss these phenomena tangentially. This may partially be because large-scale relocation is rare. Vale and Campanella (2005:3) note that from 1100 to 1800, only 42 cities were permanently abandoned. More recently, from 1800 to 2006, Campanella (2006) notes that no major city has been abandoned permanently. On a smaller scale, Perry and Lindell (1997) note that the relocation of communities away from hazards is rare in Western societies.

While relocation in the U.S., rare as it may be, is a voluntary process, decided on a household-by-household basis, there is little research on the decision making

process at a household level during the recovery process (Campanella 2006), especially related to where to live after a disaster (Fraser *et al.* 2003). The lack of research on voluntary relocation and resettlement, the potential negative consequences associated with resettlement efforts indicated by a small number of previous studies, and the on-going use of relocation as a mitigation measure following disasters drive this study. The purpose of this study is to understand how households decide to either relocate and resettle or rebuild in situ following a disaster. I am interested in the differences in the decision- and sense-making processes between households that make antithetic decisions but suffer exposure from many of the same hazards. This study proposes to look at household recovery, situated within the context of community recovery. Hurricane Sandy offers a unique opportunity to investigate this process due to the widespread destruction along the coast and the sizeable financial incentives the states of New York and New Jersey are currently offering residents of the hardest hit communities.

This research is an opportunity to bridge a critical gap in our understanding of household residential decision-making within the larger context of community recovery. While research on disaster recovery is increasing, there are few empirical studies of residential decision-making. Most of the scholarship offers “best practice” recommendations for communities considering resettlement, leaning on case studies as indicators of what practices result in a better resettlement outcome and indicators of success. While the scope is usually the community (with a limited number of studies looking at villages and cities), the unit of analysis also shifts, from individuals and

households up to community-level indicators. This project offers an empirical, systematic study of household decision making following a major disaster in a highly urbanized area with unique incentive programs that may affect the decision making process. Through a detailed explanation of the methods and theoretical underpinnings of this study, replication of this study and further exploration of this topic is possible, offering the opportunity to confirm, disconfirm, or expand on findings.

There are also numerous potential practical applications of this research. With a preliminary understanding of the process that households go through when they decide whether to rebuild or relocate following a disaster that this study offers, policymakers can use these insights in a number of ways. Policymakers may use these findings to develop better policy and programs that include what households identify as important in their decision making process to garner support for a rebuilding or resettlement project. Using the factors identified in this study, policymakers could better understand who may return to the area after a disaster and who may not come back. This could help save countless dollars on reconstruction costs of infrastructure, provide some guidance on developing new infrastructure, and when in the decision making process that this action is critical to household decision making. While this research is exploratory in nature, it offers a framework for future studies to replicate and expand upon to develop more explanatory power and understanding.

This dissertation begins with a literature review that discusses what we know about relocation and resettlement following disaster. The literature review defines and situates relocation and resettlement in the larger body of recovery literature, explores

the nature of the literature available, covers foundational models, examines decision-making motivations, risks and potential benefits to resettle, and closes with a discussion about what the literature is missing and what this study will focus on. Many of the sections close with propositions. These propositions serve as culling summary statements from the available literature. The propositions provided guidance for the development of the interview guides and the types of documents and policies I analyzed in the policy review chapter. Since this study is exploratory and the literature is meager in many areas, some sections of the literature are underdeveloped and do not warrant the development of propositions. As another effect of the exploratory nature of this study and the dearth of literature, the propositions offered are non-directional. I also chose to leave the propositions non-directional to exploit the strengths of qualitative methods, allowing the data (and my analysis of the data) to suggest if there is a relationship and the direction of the relationship. The literature review is followed by a discussion of my research methodology. These sections are followed by my analysis, findings, and a discussion of the findings. The dissertation closes with conclusions, and directions for future research.

Chapter 2

LITERATURE REVIEW

If I have seen further than others, it is by standing upon the shoulders of giants.
- Isaac Newton

Cutting Through the Concepts and Constructs

A looming or recent disaster can, and often does, cause people to leave their residences. This departure can be temporary, or result in a permanent residential change. The process of leaving an area due to a potential or recent disaster, however, is the subject of “conceptual muddiness,” where researchers use many terms (e.g., evacuation, displacement, relocation, resettlement, and migration) interchangeably. There are, however, nuanced differences between the meanings of the terms. For the sake of clarity and consistency, I will address how other researchers use these terms and offer definitions for their usage throughout this work.

- *Evacuation*, as used by Weber and Peek (2012:14), is the “movement of persons from a threatened location to a temporary safe haven.”

Evacuation is typically a rapid event in response to a warning. In the case of a hurricane, people often evacuate days before the event via personal or public transportation.

- *Displacement* is linked to evacuation, but refers to the hazard agent expelling individuals from their home (Oliver-Smith 1996). Within the literature, researchers refer to “displaced persons” in temporary housing following a disaster (Fothergill and Peek 2012:131; Weber and Peek 2012:2).
- *Relocation* refers to resiting families or communities to a new location, often with the explicit goal of moving a household or community out of high-risk zones (de Vries and Fraser 2012). It is important to note that this is not necessarily indicative of a permanent move out of an area: the term relocation is also used to discuss the product of displacement, where disasters displace families that relocate to a temporary shelter (Palacio 1982:134). At the household level, however, this is often not a single move: Padree (2012:69) documented cases of multiple families relocating nine times following Hurricane Katrina.
- *Migration* often refers to the large-scale movement of groups of people, either out of (outmigration) or back into an area (Morrow-Jones and Morrow-Jones 1991). Geographers and anthropologists typically use this term to discuss a longer-term process in response to environmental influences (Wolpert 1966).
- *Resettlement*, most notably, is a long-term process that occurs in conjunction with and continues long after relocation. During resettlement a household, neighborhood, or community reestablishes

themselves in a new location (sometimes referred to as resettlers): housing is purchased or built, children go back to schools, people return to or find new jobs, and individuals resume "normal", pre-disaster functioning and activities (Cernea 2000; Dynes 1991; Oliver-Smith 1996; Weber and Peek 2012). Resettlement also breaks down into two further distinctions: involuntary and voluntary. Involuntary refers to government-mandated resettlement, where families and communities are forced to resettle. Voluntary resettlement is also known as spontaneous resettlement, often occurring directly after a disaster. I cover this distinction more extensively in the following section.

For the purposes of this paper, I use the terms discussed above as defined below:

- Evacuation – the rapid movement of people away from a hazard
- Displacement – the state of being removed from home by a disaster
- Relocation – the act of moving to a new location
- Migration – the movement of a group of people due to environmental stresses
- Resettlement – the process of reestablishing normalcy in and commitment to, a new community or new location.

It is important to note that these terms are interrelated. In the international literature, families and communities relocate to new sites where they will resettle (Chan 1995; Correa 2011; Iuchi 2010; Shaw and Ahmed 2010). People evacuate, and disasters

displace people. Families can relocate across the street following a disaster, but stay within their community. Families, often in groups, may migrate (relocate) to a new site due to a degradation of the surrounding natural environment and resettle.

Families may relocate several times before they ever resettle. The investment in the new site and time commitment distinguishes resettlement from relocation. There is also an affective component associated with resettlement. With resettlement, families anticipate living in their new setting for an extended period, if not indefinitely. They are committed to permanency in their new setting. This may not occur until many months after the move: people may relocate to a new setting and later decide to settle in the area. The temporal and affective component of this larger process is what distinguishes resettlement from relocation.

Characterization of the Literature

In addition to acknowledging these conceptual difficulties, it is important to recognize the weaknesses and various foci the literature on relocation and resettlement covers. Relocation or resettlement, characterized as a tool for both mitigation and recovery, is often discussed as a means to achieve an end (as a method to reduce future losses or a way to kick-start recovery), but not as the primary focus of the work (Kirschenbaum 1996). This leads to the second issue: a lack of empirical studies of the relocation and resettlement process and outcomes, especially at a familial level of decision-making (Campanella 2006; Fraser *et al.* 2003; Perry and Lindell 1997). Most of this research revolves around case studies of smaller settlements (less than 1000 people) that measures outcomes of a relocation (short-term, financial, quantifiable

differences) at a community level, ignoring the longer-term process of resettlement. In addition, since researchers do not often clearly distinguish between concepts related to residential decision-making, in many of these cases it is unclear what exactly the researcher is exploring. There is also another division worth exploring between the international and U.S.-based literature.

Selected studies outside the U.S. context.

The international literature utilizes two main approaches to understand relocation and resettlement. One approach, dominated by anthropologists and psychologists, presents a narrative of the process at an individual and community level. These studies focus on the socially constructed community, investigating how individuals attach meaning to their communities, the social ties they have with their neighbors, and how to maintain this identity and these ties during resettlement. The second approach presents relocation and resettlement as a comparison of gains and losses. This approach links the decision to resettle to the cost of relocation compared to the cost and likelihood of repeated disaster losses.

Within the international field, there is little distinction made between development-, conflict-, and disaster-induced relocation and resettlement. These are typically involuntary resettlement efforts, where other governments usually have more legal authority over property than they do in the U.S. (Badri *et al.* 2006). Many of the models utilized in international resettlement projects to explain the steps in the decision-making process and expected outcomes are intended for use regardless of the

catalyst for resettlement (Correa 2011). This suggests that, among much of the international community, many researchers do not believe that the cause of relocation leads to a qualitative difference in the resettlement process. International research utilized in this literature review that specifies what country the research focuses on is displayed in Table 1, showing the country studied and the researcher. This list is not exhaustive, and many of the conceptual articles are not included in this table.

Table 1: Selected Studies Outside the U.S. Context

Location	Hazard Agent	Researcher
Armenia	Earthquake	Arnold 1993
Australia	Flood	Smith and Handmer 1986
Belize	Flood (Hurricane)	Palacio 1982
China	Earthquake, Development	Arnold 1993; de Wet 2006
Ethiopia	Development	McDowell 2002
Guatemala	Earthquake	Bates 1982
India	Earthquake and Tsunami	Shaw and Ahmed 2010
Israel	Technological	Kirschenbaum 1996
Iran	Earthquake	Badri <i>et al.</i> 2006; El-Hinnawi 1985; Oliver-Smith 1991
Italy	Earthquake	Menoni and Persaro 2008
Japan	Earthquake	Arnold 1993; Iuchi 2010
Malaysia	Flood	Chan 1995
Nicaragua	Earthquake	Haas, Kates, and Bowden 1977
Peru	Earthquake	Oliver-Smith 1991
Sri-Lanka	Earthquake and Tsunami	Shaw and Ahmed 2010
Turkey	Earthquake	Oliver-Smith 1991; Coburn <i>et al.</i> 1984
Zimbabwe	Development	Colson 1971

Selected studies within the U.S. context.

It is important to note early that U.S. policy toward relocation and resettlement is fundamentally different when compared to international policies. I thoroughly discuss these policies in the policy review of this dissertation, but it is important to

have a cursory understanding of the current U.S. policies that are in place to understand the rest of this document. One of the most cited distinctions of the U.S. approach to relocation and resettlement is that all relocations in the U.S. are legally voluntary (FEMA 2012). The government cannot legally force participation in home buyout programs, although this distinction is questionable and addressed later in the document.

The aid system in the U.S. is also unique. There is often federal assistance available to assist with relocation after a disaster. Through the Community Development Block Grant (CDBG) Program (which is what New York is currently using for their NY Rising Buyout and Acquisition Program) provided by Department of Housing and Urban Development (HUD), local governments can use federal funding to purchase properties (often referred to as “buyout programs”) from citizens in hazardous zones. Communities can also apply for money from the Federal Emergency Management Agency (FEMA) through the Hazard Mitigation Grant Program (HMGP). After a disaster, communities can put together an application for buyouts and, if deemed environmentally sound and cost-effective, FEMA can provide 75% of the funding necessary (FEMA 2012). I will discuss these two programs more thoroughly in the forthcoming policy chapter.

Within the U.S., the literature surrounding relocation and resettlement is also fundamentally different. A majority of the research is only tangentially related to relocation and resettlement, the work focuses on evacuation and temporary sheltering (Oliver-Smith 1991; Sastry 2009). The literature that does discuss relocation and

resettlement in the U.S. comes from urban and regional planners, with a focus on recovery planning efforts and assessments of relocation and resettlement cases. Recovery plans, if they exist, guide emergency actions after a disaster, and offer planners a unique opportunity to reimagine their community prior to a disaster (Berke and Campanella 2006). The planning literature focuses on the content of recovery plans and who is involved in their creation, suggesting that recovery plans are an opportunity to pre-define safe areas for relocation and eventual resettlement, increasing the likelihood of relocation (seen as a dramatic change that would be difficult to organize post-event) taking place (Berke and Campanella 2006; Mileti and Passerini 1996).

Assessments of post-disaster resettlement in the U.S. focus more on the outcomes of relocation and buyout programs. They are typically cross-sectional studies, concentrating on post-event population growth, business diversity, and changes in Gross Domestic Product (GDP). Much like the second international approach discussed, U.S. studies look at the decision to relocate and eventually resettle as a cost-benefit analysis. The U.S. literature also bifurcates at another point, discussing buyout programs and relocation without much attention paid to the complicated relationship between the two concepts. Since all buyouts are voluntary in the U.S., the option to sell is one factor among a number of others (job opportunities or perception of safety, for example) affecting the decision to relocate and even resettle. While there are a variety of disasters represented in U.S. case studies of relocation and resettlement, a majority of the literature focuses on communities that

suffered repeated losses from river flooding events and hurricanes. Table 2 displays the case studies that had, at least, a partial focus on relocation or resettlement in the U.S.

Table 2: Selected Studies Within the U.S. Context

Location	Hazard Agent	Researcher
Alaska	Earthquake	Haas, Kates, and Bowden 1977
Arizona (Hopeville)	Flood	Perry and Lindell 1997
California (San Francisco, Watsonville, and Oakland)	Earthquake	Bolin and Stanford 1998; Haas, Kates, and Bowden 1977; Johnson 1999; Mileti and Passerini 1996
Florida	Flood (hurricane)	Bevington <i>et al.</i> 2011; Peacock, Morrow, and Gladwin 1997
Great Floods of 1993 (Misc.)	Flood	Changnon 1995
Kansas (Greensburg)	Tornado	Paul <i>et al.</i> 2007
Louisiana (New Orleans)	Flood (hurricane)	Berke and Campanella 2006; Bevington <i>et al.</i> 2011; Briggs 2006; Campanella 2006; Emily and Storr 2009; Fothergill and Peek 2012; Freudenberg <i>et al.</i> 2009; Green and Olshansky 2012; Miller and Rivera 2007; Mueller <i>et al.</i> 2011; Myers, Slack, and Singelmann 2008; Padree 2012; Peek and Weber 2012; Sastry 2009; Wilson and Stein 2006
North Carolina (Kinston and Greenville)	Flood (hurricane)	de Vries and Fraser 2012; Fraser <i>et al.</i> 2003; McCann 2006; Smith 2011
North Dakota (Grand Forks)	Flood (hurricane)	de Vries and Fraser 2012; Fraser <i>et al.</i> 2003
South Dakota (Rapid City)	Flood	Haas, Kates, and Bowden 1977
Oklahoma (Picher)	Technological	Shriver and Kennedy 2005
Texas (San Antonio)	Flood	de Vries and Fraser 2012; Fraser <i>et al.</i> 2003
Wisconsin (Soldiers Grove)	Flood	Becker 1983; David and Mayer 1984; Tobin 1992

Proposition 1A: Federal, state, and local policy may affect household and community residential decision-making.

Proposition 1B: Knowledge of FEMA's HMGP funding may be an important influence in this process.

Proposition 1C: Knowledge of HUD's CDBG funding may be an important influence in this process.

Applicability of international literature.

With these two separate bodies of literature in mind, my general research question probes an interesting space. I am exploring the residential decision-making process in the U.S., at a longer timescale than most U.S. studies, with attention to a smaller scale than is typical in a U.S. context, and interest in the human decision-making process, not just the financial feasibility and desirability of relocation and resettlement. Because of this, my study does not fit neatly into either body of literature. I am not the first, or the last, to encounter this issue. Researchers often question the applicability of international literature in a U.S. context. In this case, confounding variables may make this an appropriate concern. International studies may not be comparable or applicable to voluntary relocation or resettlement studies due to differences in motivations, access to resources, or policy settings that either motivate or inhibit the decision-making process.

This is an especially difficult concern to address with the lack of empirical studies of residential decision-making. Previous studies of recovery, however, suggest that these bodies of literature are congruent. Berke, Kartez, and Wenger (1993:98)

argue that various studies found more similarities than differences between international and U.S. cases, and that “the lessons derived from recovery experiences in differing societies can have much cross cultural validity and utility.” Other relocation and resettlement studies also utilize both U.S. and international examples to generalize about the process (Berke and Campanella 2006; Haas, Kates, and Bowden 1977; Huq *et al.* 2007). Since this is an exploratory study focused on household decision-making, I want to explore every possible factor in the decision-making process, without incorrectly assuming some elements do not apply. With this in mind, this work draws propositions, background, and general understandings from both bodies of literature.

The planning literature often emphasizes that the U.S. cases are all voluntary, differentiating them from forced relocation in the international community associated with development and disasters. This split may not be as stark, however, as policies suggest. In a study conducted of four buyout communities in the U.S., de Vries and Fraser (2012) found that 35% of those polled did not know the buyout was voluntary. When looking at the same cases, Fraser *et al.* (2003) found many respondents reported “an overwhelming pressure to sell as their only option” and that 42% of the households interviewed stated, “If given the opportunity, they would have stayed and rebuilt.” In addition to misunderstanding their options, Fraser and his colleagues also found that residents felt they did not have the option to not participate, and that their city would foreclose on the property due to public health threats, use eminent domain to take their property, or not provide utility services. de Vries and Fraser (2012) also

identified the power of peer pressure in Kinston, NC, where a city manager told residents they might be the last house on the block if they did not accept the buyout.

Proposition 2: The availability and perceived voluntariness of buyouts may affect household residential decision-making.

Models of the Resettlement Process

Researchers have proposed four conceptual, iterative models of the resettlement process. It is important to note that all of these models focus on international, involuntary resettlement due to any number of causes, including disasters, development, and conflict; there are no known models that specifically focus on voluntary resettlement. These models also vary in scope, ranging from individuals up to communities.

Scudder and Colson model of resettlement.

Scudder and Colson (1982:274) proposed a four-stage model to conceptualize what they saw as the linear process of resettlement: recruitment, transition, potential development, and incorporation. This model conceptualizes this process at a community level, while acknowledging that individual families make decisions to resettle. Figure 1 visually displays these stages. While this model focuses on involuntary resettlement and relies on examples from involuntary resettlements as conceptual proof, the authors posit that the process is much the same for voluntary resettlement (Scudder and Colson 1982:274).

During the recruitment stage, decision makers and citizens decide whether to resettle in the weeks, months, or years following an event. The transitional stage starts

when individuals begin relocating to the newly selected site and ends when economic and social systems are re-established. The authors note that during this phase citizens typically avoid unnecessary risky behaviors, such as changing a career. Throughout this phase, people will often relocate with family and only move as far as necessary to maintain a sense of familiarity and comfort. Grasping for this sense of normalcy also helps to avoid additional stress, which is already at such an elevated level that this phase shows potential links to an increased death rate. This phase typically lasts more than two years and, without proper execution, can continue indefinitely. The authors suggest that outside aid can help to shorten this phase by assisting with reconstruction. As the process moves to the potential development stage, stress levels begin to decrease, risk avoidance stops controlling behavior and normal day-to-day activities begin to resume. A community achieves the final phase of incorporation when groups that came to assist with the process leave and the town returns day-to-day operations back to the citizens and local government. According to this model, when a community regains its independence and position within the larger societal context, it successfully resettles (Scudder and Colson 1982:276).

Clear examples of this process from stage one to stage four are difficult to find. These cases require longitudinal studies with extended investment in specific sites, or multiple follow-up studies. As noted earlier in the literature review, there is a dearth of longitudinal studies of community recovery. With these barriers in mind, Scudder and Colson (1982:276) suggest that, in retrospect, some communities appear to have passed through the cycle, while other more current cases seem to be progressing

through the cycle as predicted by the model. As suggested by the model, this process is messy and there are points where communities “get stuck” and never complete the phases. Scudder and Colson discuss one of the three cases Palacio (1982:123) studied in Belize post-Hurricane Hattie as an example of a resettlement failed, where residents returned to the original (deemed unsafe) site due to a lack of employment opportunities in the new site.

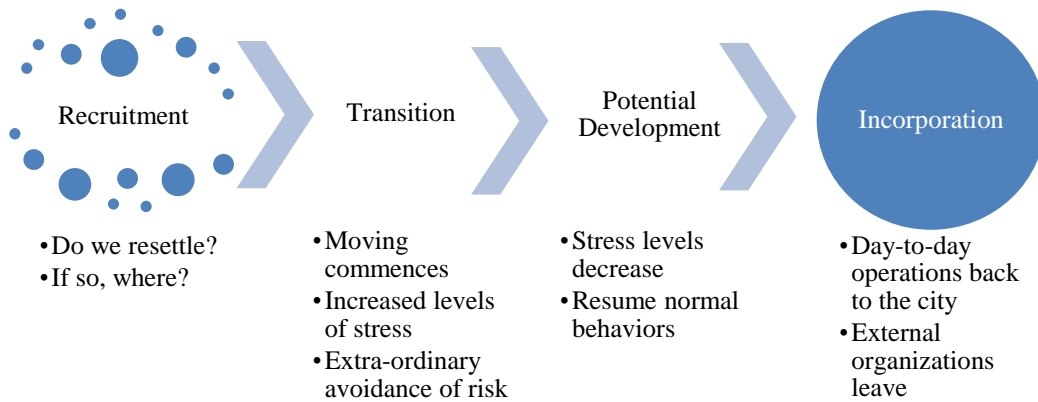


Figure 1: Scudder and Colson Model of Resettlement (1982)

One of the glaring issues with this model is it lacks specificity. While it focuses on involuntary resettlement, it does not leave room to address the distinct issues that different triggers for involuntary resettlement may bring (the difference between conflict and disaster, for example) or differences in powers of governments. It also does not allow for contrary reactions to resettlement, it assumes a homogenous response and recovery rate of individual community members to resettlement.

Individuals and households may recover at differing rates, leaving stages at different times instead of as a unit, and experiencing more or less adverse reactions to resettlement-induced stress. The linear rigidity of this model is another major point of debate within the field.

Impoverishment risks and livelihood reconstruction model.

Cernea (1997) argues that the Scudder and Colson Model of Resettlement really only applies to the exception to the rule rather than applying to all cases. That is, only a small portion of resettlement efforts experience this routinized set of stages. In its stead, Cernea suggests that most cases do not follow this ordered pattern, and may skip steps altogether. To address this, Cernea offers the Impoverishment Risks and Livelihood Reconstruction (IRLR) model with eight variables, not attached to any specific timeline, which all resettlement efforts must address: increased morbidity, joblessness, homelessness, landlessness, economic marginalization, food insecurity, loss of access to common property, and social disintegration. It is important to note that these variables are not mutually exclusive: Cernea suggests that in many resettlement efforts these variables are inter-related. While each example is development-induced resettlement, Cernea found that in Brazil, following the construction of a reservoir, household income fell, on average, by 50% and land ownership fell by 47%, which Cernea suggests is due to the loss of farmland.

Building upon his work on Sustainable Livelihood Research, McDowell (2002) suggests that Cernea's approach ignores the importance of institutions, informal networks, and the loss of social capital when individuals spread

geographically during mass relocation. By understanding these bonds, McDowell suggests that we can better understand the impacts of resettlement and what new bonds may form that influence the resettlement process. In a similar criticism of both approaches, De Wet (2006) suggests that resettlement is much more complex than any model can account for; the process varies from one occurrence to the next and no models can incorporate all of the important variables. Following this line of thinking, a failed resettlement process is not the result of a lack of resources or any other singularly reducible variable, but rather a failure somewhere in the space where culture, resources, policy, institutions, and the physical environment meet. Instead of a checklist or rigid order of operations, De Wet suggests a more open, participatory process of resettlement, leaving the opportunity to respond organically to developing demands. This idea suggests that instead of planning for a community, planners should invite public input when making decisions, such as site selection and prioritizing new development. In many international settings, this occurs through a community advocate (typically an anthropologist), that is involved in the planning process but also understands the needs of the community (Palacio 1982:122).

Push-pull model.

Migration studies also offer a model that may prove useful for understanding residential decision-making. Wolpert (1966) proposed a push-pull model, which focuses on how communities respond to stressors (termed “noxious forces”). Wolpert used this model to explain why neighborhoods and communities in particular areas experienced outmigration. Speare (1974) builds upon this model, suggesting that

stressors can reach a “stress-threshold,” where the stressors outweigh the benefits of living in an area, leading to relocation. When the stressors exceed this threshold, Speare argues that individuals look for a more desirable setting, explaining community outmigration. Speare (1974) suggests that these stressors build over time and can eventually push people out of a setting, terming negative forces that reduce the quality of life in an area “push factors” and positive forces associated with favorable assessments on the quality of life in an area “pull factors”. Speare reached this conclusion after finding that individuals interviewed that expressed dissatisfaction with their current community were more likely to move within one year than their counterparts that were happy with their community. Initially these studies focused on economic and environmental push and pull factors, such as job opportunities, safety, and leisure option. In addition, Lonergan (1998) suggests that dissatisfaction with government, demographic changes, population growth or loss, and low living standards can be “push factors”. “Pull factors”, alternatively, may include improved housing, educational opportunities, climatic conditions, and social ties in an area.

Criticisms of the push-pull model may limit its applicability to this study. First, as noted by Neff and Constantine (1979), this model was developed to explain large-scale movements, so the applying it to household-level decision-making risks an ecological fallacy. In effect, studies have focused on the existence of noxious forces and general demographic trends in an area, rather than examining how people perceive the noxious forces and their role in household level decision-making. Another criticism against the push-pull model is that it does not explain why people choose one

destination over another, or that it focuses too much on the “push” side of the equation (McLeman 2006). At a community level, McLeman (2006) also suggests that the model offers little to explain comparative migratory behavior in similar settings.

It is also important to note that the link between disaster-induced relocation, resettlement and migration may be thin and almost certainly understudied. These studies typically focus on everyday concerns, such as safety, air quality, and traffic, which are qualitatively different from the rapid-onset stress caused by disasters. Mileti and Sorensen (1988:75) support this observation, suggesting that “the emphasis on the perception of risk and threat as prime catalysts in changing a residence are... nearly non-existent in migration studies.” With the growing popularity of climate change research, however, more researchers are considering the applicability of push-pull factors related to risk perception and emerging hazards (Black *et al.* 2011:30; McLeman 2006; Perch-Nielsen and Bättig 2008; Reuveny 2007).

In summary, this review of the resettlement literature has provided a linear model, a checklist of resettlement concerns, a suggestion to consider the importance and changes in social capital, a call to leave the process flexible and adaptable to emergent needs, and models created for urban populations responding to stressors. The Scudder and Colson model, much like that of Haas, Kates, and Bowden (1977), may be inherently rigid but does offer an overview of the stages a community passes through while resettling. Cernea’s (1997) insights on the individual, household, and community-level considerations suggests elements that a community should be vigilant of during resettlement and use the planning process to develop strategies in

case issues manifest. McDowell (2002) reminds community decision makers of the importance of social capital and the risks of splitting up a community. De Wet (2006) is the outlier of this group; while it does not appear that he is recommending abandoning planning, he is suggesting that instead of a roadmap and a list of concerns that the process be more open and participatory. These views may initially seem incongruent but I do not believe that these approaches are mutually exclusive; a community could develop a plan that acknowledged the suggested stages, monitor for Cernea's considerations, attempt to keep kinship and institutional ties intact and effectively allow for improvisation to emergent needs. I will return to these concepts in the development of my discussion and conclusion to see if my findings relate to any of these models.

Models of the risks of resettlement.

Beyond conceptualizing the resettlement process, both U.S. and international researchers also outlined the risks to both the community and individuals. Mileti and Passerini (1996) note that resettlement may lead to high levels of stress, resulting in depression, suicide attempts, post-traumatic stress disorder, heart attacks, strokes, etc. At a macro level, Badri *et al.* (2006) defined four of the most common adverse impacts of resettlement on the population. 1) No shelter, coupled with a lack of food and sanitation, typically leads to significant health issues. 2) Losing a mode of production (loss of land, resources, equipment, etc.) can lead to significant economic losses. 3) A disruption of social networks and a lack of access to social capital affect

both mental and physical well-being. 4) The loss of cultural assets, as mentioned earlier, can have an adverse psychological impact.

Moving to a more micro level, Scudder and Colson (1982:269), in addition to their model of resettlement, propose a model to explain the stress associated with involuntary resettlement, which multiple case studies note as a significant issue (Badri *et al.* 2006; de Vries and Fraser 2012; Mileti and Passerini 1996; Riad and Norris 1996; Shaw and Ahmed 2010). This model breaks stress down into three forms: physiological, psychological, and sociocultural. Physiological stress appears mainly in the transition period, and manifests in increased morbidity and mortality rates. They note that the elderly are the most susceptible to this type of stress, often dying “of a broken heart”. Psychological stress is attributed to different potential causes (survivor guilt, angst about an ambiguous future, etc.) and manifests as the risk-adverse actions mentioned in the Scudder and Colson (1982:273) model. Oliver-Smith (2010) suggests that the psychological impact of resettlement is directly proportional to the abruptness of resettlement, which Scudder and Colson note is most prevalent in disaster-related resettlements. Sociocultural stress is linked to loss of cultural artifacts and economic and political stability. The authors note that resettlers often find it difficult to obtain employment in their new setting.

Proposition 3: Resettlement may result in increased levels of physiological, psychological, and sociocultural stress for household members.

In an attempt to operationalize information about these potential negative impacts, Correa (2011) states that decision makers could make predictions regarding

the severity of impacts on a population based on objective, measureable characteristics of the population. These characteristics include individual attachment to the original property (tenure and right, time at property, use(s), etc.), profession, familial position, connections in the area, and the extent to which they planned the resettlement (implying that a more thoroughly planned resettlement will have better outcomes, which aligns with much of the U.S. planning literature but contradicts De Wet). The intention is that with this information prior to a disaster, decision makers could use this information to decide whether they should resettle or rebuild in situ. While this is an admirable and potentially worthwhile undertaking, there are a few issues with this approach. Based on the literature provided, there is a dearth of studies to make the claim that this is an exhaustive, generalizable list of the variables that affect resettlement. Decisions regarding thresholds to resettle or rebuild in situ would be arbitrary, taking the purported objectivity out of the decision. In addition, the cost and time associated with gathering and maintaining this data would be prohibitive (past what tax information already provides).

What Do We Know About Decision-Making After a Disaster?

Propensity to rebuild in the same spot.

Past studies show, more than anything, that families and communities tend to rebuild in the same spot after a disaster. Resettling is the exception to the rule. As stated by Dynes (1991:11), "people live in communities which exist for some reason, even though those reasons may be ancient and not known by present governmental officials. Those reasons still persist even if the community is in a risky location." This

view posits that individuals and families live where they do and reconstruct their lives after a disaster in the same location and in a similar fashion because the area they live in allows them to have access to the resources necessary to survive. Past the tangible desirability of a location, there is also an emotional component to place. Oliver-Smith (1996:308) explains that place is a part of the construction of "...individual and community identities, in the encoding and contextualization of time and history, and in the politics of interpersonal, community, and intercultural relations." From this perspective, the loss of place is analogous to the loss of a part of our identity that society mourns, and our initial reaction is naturally to reconstruct it in the same place as similarly as possible to how it was prior to the disaster.

Haas, Kates, and Bowden (1977) conducted one of the first studies to look at decision-making in reconstruction, which still stands as one of the most influential works in the field. The study focused on community recovery from four disasters: the 1906 San Francisco earthquake, the Great Alaskan Earthquake of 1964, the 1972 Rapid City flood, and the 1972 earthquake in Managua, Nicaragua. They identified many important patterns in community recovery that shaped much of the later research. One of the key findings was that communities typically rebuild in the same location in much the same way, exposing them to many of the same vulnerabilities. Even when cities tried to promote structural and land use changes to reduce vulnerability, there was often pushback from the public; they wanted their old city back the way it was prior to the event. Subsequent studies also found this affinity to

rebuild in the same spot in the same way, regardless of the risk (Arnold 1993; Campanella 2006; Green *et al.* 2008; Oliver-Smith 1991).

Later studies developed findings that were at odds with this ordered, rigid cycle. This “value added” approach, where each stage builds upon successes from the previous stage, did not match empirical findings (Berke, Kartez, and Wenger 1993). Rubin, Saperstein, and Barbee (1985) stated that, based on their literary analysis of studies of recovering communities, the recovery period did not always immediately begin as Haas, Kates, and Bowden suggested and did not follow a logical order. They felt this was due to many factors that could convolute the recovery effort, including the nature of the disaster agent itself, cultural differences between (and struggles within) communities, and differences in outside aid and pre-existing resources within a community. Johnson (1999) also found that recovery from Loma Prieta did not follow an orderly pattern; key stakeholders meetings held to address the residents’ needs shaped the process. An important note though is that Rubin, Saperstein, and Barbee did not suggest that Haas *et al.* had the wrong categories, just that the rigidity recommended may not exist. Johnson also appears to reinforce this, stating that the emergency managers she interviewed referenced the recovery period in phases that closely aligned with the phases proposed by Haas *et al.*, but emergency managers suggested that, due to both political and resource demands, these events often happened in a different order.

Attachment to place.

With this pattern of rebuilding in situ in mind, it is important to consider where this attachment was rooted. Much of the literature on attachment comes from community psychology. The literature in this area treats place as a social construction that expands beyond the physical elements of place and explores attachment between people and a specific location (Hidalgo and Hernandez 2001). Studies exploring this bond focus on factors such as commitment to an area, satisfaction with a community, sense of belonging, emotional bonds in an area, and the ability of an area to meet the basic needs of families (Pretty, Chipuer, and Bramston 2003).

One issue when approaching this body of literature is researchers describe attachment under the guise of a number of different constructs, including sense of place (Jorgensen and Stedman 2001), sense of community (McMillan 1986), community attachment (Kasarda and Janowitz 1974), attachment to place (Williams *et al.* 1992), place identity (Cuba and Hummon 1993), place attachment (Hidalgo and Hernandez 2001), and place dependence (Gibbons and Ruddell 1995). While these constructs do have nuanced differences, there is considerable overlap and ongoing discussion within the field of community psychology on how to bound each construct (Jorgensen and Stedman 2001; Pretty, Chipuer, and Bramston 2003). It is not the goal of this work to correct the unarticulated, overlapping constructs used to describe this phenomenon. Rather, for the purposes of this study I use place attachment as the umbrella term and utilize a two-dimensional model of place attachment, consisting of place identity and place dependence. Previous studies show that these two concepts

reliably measure attachment to place (Raymond, Gregory, and Weber 2010; Semken, Neakrase, and Dial 2009; Williams and Vaske 2003).

Place identity involves how individuals feel about a setting, the connections they have to that setting, and how connections to that location or symbolic elements from that setting form part of their conceptualization of self. As noted by Cuba and Hummon (1993), place identity answers questions about identity with place and symbolic elements from that setting (like a library, for example). Local social bonds, community involvement, major life events in a setting (such as raising children), and length of time in a setting all strengthen individualized place identity. As noted by Pretty, Chipuer, and Bramston (2003), place dependence relates to “the quality of the current place in terms of the availability of social and physical resources to satisfy goal directed behaviour, and how it compares to other alternative places.” Place dependence emphasizes the functional reasons people are attached to a specific location (White, Virden, and Riper 2007). This is often associated with the availability of employment opportunities, desirability of housing, and the ability of a setting to provide access to desirable recreational activities, such as activities for youth, boating and fishing.

In four case studies in the U.S., Fraser *et al.* (2003) noted that many residents stated that, when deciding whether to relocate or rebuild, their connection to their neighborhood was just as important, if not more important, than the likelihood of future flooding events. Connection through generations may make residents more hesitant to move, suggesting that by abandoning their land they are also abandoning

their ancestors' commitment to the area. Shriver and Kennedy (2005) found that interviewees felt that if they relocated they would also be abandoning the history of their community. Myers, Slack, and Singelmann (2008) found that those with less social ties to a community were more likely to relocate after Hurricanes Katrina and Rita. Numerous other disaster studies support the idea that a families' perceived attachment to place affected their decision to resettle (Correa 2011; de Vries and Fraser 2012; Emily and Storr 2009; Fraser *et al.* 2003; Green and Olshansky 2012; Mileti and Passerini 1996; Myers, Slack, and Singelmann 2008; Oliver-Smith 1991; Shriver and Kennedy 2005; Smith and Handmer 1986).

Proposition 4: Attachment to place may affect household residential decision-making.

Destruction of the built environment.

It is worthwhile to note that attachment to place as a social construct may have limits and may not carry generalizable explanatory power. Researchers noted that when a catastrophe occurs there is the chance that there will be such widespread destruction those families may no longer recognize the area they previously lived in as home. Multiple researchers, in interviews with New Orleans evacuees following Hurricane Katrina, found that many families did not have plans to return to New Orleans because they felt that their "sense of place" was gone (Emily and Storr 2009; Miller and Rivera 2007; Wilson and Stein 2006). They described feeling their community underwent such extreme change and had not recovered, so it was not the same place anymore. Many even noted that their current living conditions in the

communities they evacuated to were better than their pre-disaster conditions, so that served as an incentive not to return to their previous home.

Numerous studies found that the level of damage to the built environment affected whether people rebuilt or relocated (Emily and Storr 2009; Green and Olshansky 2012; Kirschenbaum 1996; Miller and Rivera 2007; Myers, Slack, and Singelmann 2008; Wilson and Stein 2006). Each case reported a positive relationship: the more damage done by the disaster, the more likely the household was to relocate. As noted by Myers Slack, and Singelmann (2008), however, this may apply more to those with fewer economic and social resources to return to and rebuild their homes. In a study of residential property buyouts following Hurricane Katrina, Green and Olshansky (2012) found that the more damage done to a household's dwelling, the more likely they were to participate in a buyout. They also found, in contrast to other studies, that home value, income, tenure, and minority status did not have a statistically significant effect on likelihood to sell.

A threshold of destruction that influences decision-making on relocation and resettlement, however, does not necessarily undermine the potential explanatory power of attachment to place. This does not necessarily mean that attachment to place is unimportant, but that an individual's construction of place may be more strongly related to the physical environment than acknowledged. I should also note a pragmatic point not discussed in this literature extensively but that is important to this discussion. People also do not always choose where they live. They may have inherited their home, or they may live where they do because the rent is affordable and gives them

access to public transportation. Other research suggests that rebuilding may be the result of mental and physical exhaustion. Oliver-Smith (1991) suggests that citizens may reject resettlement projects because they already went through one traumatic experience (the disaster) and do not want further disrupt their lives. This also aligns with Scudder and Colson's (1982:277) discussion of avoiding risky behaviors post-disaster.

Proposition 5: The level of damage to the physical environment may affect household residential decision-making.

Income, access to resources, and minority status.

As noted by Peacock, Morrow, and Gladwin (1997) vulnerable populations experience disproportionate suffering during a disaster and often have the most difficulty recovering. They consider this phenomenon, much like Bolin and Stanford (1998), as an extension and exacerbation of pre-event functioning. Case studies, particularly from New Orleans following Hurricanes Katrina and Rita, suggest that minorities (Fraser *et al.* 2003; Morrow-Jones and Morrow-Jones 1991; Peek and Weber 2012) and those with lower income are more likely to relocate and resettle (de Vries and Fraser 2012; Kirschenbaum 1996; Myers, Slack, and Singelmann 2008; Peek and Weber 2012).

Following Katrina and Rita, higher income, white homeowners were the most likely group to return to New Orleans (Weber and Peek 2012:16); blacks, poor or lower income residents, and renters were less likely to return. Weber and Peek (2012:16) suggest that individuals and households with limited resources may want to

return to an area but not have the resources necessary to return. When studying resettlement following the Majil Earthquake of 1990 in Iran, Badri *et al.* (2006) found that resettlement had the most adverse impacts on vulnerable members of society, especially women in this case.

Part of this may link to land-use patterns and construction standards. Often, low-income, minority, and the elderly live in hazardous zones (such as floodplains) in poorly constructed housing with minimal investment in mitigation measures, which leads to a higher chance of experiencing disasters (Fraser *et al.* 2003; Morrow-Jones and Morrow-Jones 1991). This increased exposure, coupled with a lack of resources and structural mitigation, inevitably leads to a higher likelihood of disaster events, a buyout offer, and an opportunity to resettle. Another contributing factor here is that private developers, not the city, redevelop residential properties following a disaster. Following Katrina and Rita many low-income housing options were destroyed or never rebuilt, which essentially priced-out many low-income families from returning to the city (Padree 2012:63).

Research also suggests that there is a temporal element to consider. Oliver-Smith (1991) suggests that families with higher incomes and access to resources may relocate immediately after a disaster because they have the means to do so. They do not need to wait for insurance or other benefits to begin the rebuilding process, having the resources, to some extent, to absorb disaster losses (de Vries and Fraser 2012). This can also lead to the opposite outcome. Families with higher incomes may not

want to relocate, having the resources necessary to pay for structural mitigation and more representation of their views in government (de Vries and Fraser 2012).

Proposition 6: Household income and access to resources may affect household residential decision-making.

Proposition 7: Minority status may affect household residential decision-making.

Risk perception.

As simple as it may sound, some communities experience more hazard exposure than do other communities. When recurring disasters threaten the existence of a community, it is important to understand how families process the risks they are taking by living where they do and how important that comprehension is when deciding whether they will resettle or rebuild in situ after a disaster, especially if they have been directly affected by the event. Unfortunately, scholars have not spent much time exploring this area. According to Mileti and Sorensen (1988:75), “emphasis on the perception of risk and threat as prime catalysts in changing a residence are for the most part incidental in the disaster literature.” In trying to understand the household decision-making process, it is critical to determine how different those parties affect that decision-making act on their assessment of that risk.

Some more recent studies attempt to address this shortcoming, but still leave knowledge gaps. Fraser *et al.* (2003) note that community planners, following hurricanes Fran and Floyd in North Carolina, constructed risk as the probability of

recurrence and potential impacts of future flooding events. Rebuilding where a disaster previously occurred, as in this scenario, is seen to increase the risk for future disasters (Mileti and Sorensen 1988). Dynes (1991) argues that decision-makers who chose to relocate a community most often state that relocation was the only way they could prevent a similar future occurrence.

How individuals construct risk is a well-studied area, with researchers outlining a number of variables that contribute to risk perception. Norris and Murrell (1988) suggest that when a disaster occurs, people tend to evaluate their risk based on the chances that the disaster will reoccur at the same site. Slovic (1999) states that this process is more complicated, and that individuals construct risk based on subjective interpretations of objective hazards. Expanding on this idea, Kirschenbaum (2005) adds that many factors influence the way individuals perceive risk, such as experience with a disaster, history of an area, knowledge of hazard agents, and the way risk is communicated. He also suggests that individuals do not make this determination in isolation; these decisions are also dependent on communities and social networks.

Fraser *et al.* (2003) built upon this, suggesting that while individuals may perceive their own risk as a combination of subjective interpretations, knowledge, and history, they may consider additional variables when determining risk for a family. In the case studies they examined, they found that families constructed risk as a more complex construct, considering the probability of future flooding as the planners did but also including: concerns of potentially increasing debt by resettling, their ability to find affordable housing, and the risk of losing neighborhood ties. Families, then,

evaluate risk on multiple levels, sometimes unconsciously ranking abstract constructs and assigning differential weights to those variables. In this case, familial risk perception cannot be reduced to the same equation community planners utilized.

The link between risk perception and mitigative and preparedness behavior (relocating, for instance) is not fully validated in the literature and needs further investigation (Kirschenbaum 2005). This is partially due to our lack of specificity on what controls risk perception and the complexity and subjectivity of risk conceptualization. As noted earlier, there are numerous examples of communities living on active fault lines or in well-defined floodplains after repeated losses. This implies that, as familial risk perception cannot be reduced to an equation, it also cannot fully explain residential decision-making. That is not to suggest, however, that it is not important. While the literature suggests that familial-level valuation of risk is complex, a number of the cases found that families that considered their area more risky were more likely to resettle (Fraser *et al.* 2003; Kirschenbaum 1996; Shriver and Kennedy 2005; Smith and Handmer 1986).

Taking the above into account, the literature suggests that three different approaches to risk are represented in a potential resettlement event:

- 1) A professional perspective that emphasizes the probability and potential impact of future events (for use in a cost-benefit approach),
- 2) An individual conceptualization of risk, including any number of factors, such as disaster experience and knowledge of the disaster agent
- 3) A more complex, multivariate construction of risk at a familial level.

While there is a great deal of research that focuses on type one and two, there is limited research on familial, household level risk perception, and the link between household level risk perception and residential decision-making.

Proposition 8: Household risk perception may affect residential decision-making.

Pre-existing conditions.

Due to inherent complexities in the decision-making process, it is difficult to sort out whether the decision to relocate and resettle is in response to hazards exposed by a recent disaster or other pre-disaster conditions (including deficiencies in pre-event functioning). Research from the early 1980s, such as El-Hinnawi (1985), suggests that disasters, as a singular agent of change, create "environmental refugees" that are forced to leave their homes and resettle due to hazards. However, other researchers assert that the choice to relocate or resettle is seldom, if ever, linked only reducing disaster vulnerability. They argue that displacement, relocation, and eventual resettlement can typically be traced back to underlying, pre-existing economic, political, or social factors: the disaster simply serves as the catalyst for change (Castles 2002).

At a community level, there can be many appealing reasons to resettle. Resettlement offers a community the chance to rebuild in smarter ways that address pre-existing societal issues in a new location, away from the vulnerability that enabled the disaster (Cernea 2000; Iuchi 2010). Prater and Lindell (2000) suggest that extreme events open a window of opportunity to build back better and instate new policies and

building codes, which can significantly reduce vulnerabilities. These opportunities may allow a city to address underlying issues related to pre-event functioning that they could not manage as easily prior to the disaster, such as housing disparities, aging infrastructure, out-of-date facilities, or a singularly driven, struggling economy (Berke and Campanella 2006; Berke, Kartez, and Wenger 1993; Changnon 1995:256; Paul *et al.* 2007).

A few other factors that affect residential decision-making are important to consider. As noted earlier, people often desire to return to normalcy as quickly as possible (Berke, Kartez, and Wenger 1993). This has two consequences. First, support for measures to reduce vulnerabilities (such as relocation) is typically the strongest following a disaster (Berke and Campanella 2006; Berke, Kartez, and Wenger 1993; Rubin, Saperstein, and Barbee 1985; Paul *et al.* 2007). Second, the window for meaningful change is often short (Berke and Campanella 2006). This is part of the reason the planning literature emphasizes pre-disaster recovery planning. After an event, there is not enough time allowed to make the complex, interdependent decisions necessary during the recovery period (Berke, Kartez, and Wenger 1993). Pre-existing plans offer the opportunity to research potential changes ahead of time, address potential issues, and garner support for specific plans.

Many studies emphasize the role of pre-event functioning in residential decision-making (Berke, Kartez and Wenger 1993; David and Mayer 1984; Dynes 1991; El-Hinnawi 1985; Fraser, *et al.* 2003; Tobin 1992). Fraser *et al.* (2003) found that a number of residents embraced the chance to resettle, noting concerns over crime

and drug use in their pre-disaster communities. Other residents stated that their town was run down and not well maintained, which they more often cited as a reason to resettle than the risk of future flooding. In the case of Soldiers Grove, the downtown area was dilapidated, and plans were already in place to relocate the business district prior to the flooding (David and Mayer 1984).

Proposition 9A: Pre-existing, negative conditions may affect post-disaster residential decision-making.

Proposition 9B: Pre-event disaster recovery planning may facilitate community resettlement.

Miscellaneous indicators.

Since most relocation and resettlement studies are single-site, cross-sectional, and consider small populations, there are a number of elements with less research than those listed above that may also affect residential decision-making, but have less empirical backing. These studies are represented in Table 3. Since many of these studies did not explain in detail their data sources, controls they used to isolate variables, or even their unit of analysis, I want to emphasize that a portion of the variables identified in this table may be invalid and may instead be representing the relationship between income, access to resources, and propensity to resettle.

Table 3: Miscellaneous Factors That May Affect Resettlement Decision-Making

Indicator	Relationship	Researcher
Age	Older are more likely to oppose resettlement	Fraser <i>et al.</i> 2003; Tobin 1992
	Older are more likely to be offered a buyout	de Vries and Fraser 2012; Fraser <i>et al.</i> 2003
Marital status	Widowed are more likely to relocate	Morrow-Jones and Morrow-Jones 1991
Gender	Women are more likely to relocate	Morrow-Jones and Morrow-Jones 1991
Profession	More likely to oppose resettlement if it affects job	Correa 2011
Trust in governance	More trust leads to more support for resettlement	de Vries and Fraser 2012; Fraser <i>et al.</i> 2003; Perry and Lindell 1997
Education	More education correlated with increased desire to resettle	Paul <i>et al.</i> 2007
	Less education correlated with more likely to relocate	Morrow-Jones and Morrow-Jones 1991

Proposition 10A: Demographic differences among households may affect resettlement decision-making.

Proposition 10B: Differences in trust in governance among households may affect residential decision-making.

What Can We Learn From Case Studies?

Along with suggesting what may be important in decision-making, the literature provides a collection of case studies that, when taken together, offer "best practice recommendations." These studies discuss elements of resettlement that can either help or hinder the process. Since these are case studies of single communities, the lists are typically both extensive and circumstantial. Another limitation of this

literature is that these recommendations typically are in list form, without much explanation as to why they are successful or how to implement each recommendation. With this in mind, the discussion below begins by outlining how the literature defines successes and failures then shifts to cover critical elements that were commonly cited across the case studies as necessary for a successful resettlement effort.

Successes and failures.

Once a community resettles, one of the first questions asked is if this resettlement was a success or a failure. While acknowledging that this is a value-laden, subjective determination, Oliver-Smith (1991:15) simply defines resettlement failure as "outright rejection and abandonment of a site." This suggests that if the community does not ever relocate to the newly designated site or abandons the resettled community, then the resettlement is a failure. Coburn *et al.* (1984) expands on this, giving six measureable factors that can indicate if a resettlement project is successful: 1) the number of houses occupied; 2) the modification of the houses; 3) the condition of the houses; 4) the development of outside decorations (gardens, etc.); 5) the investment in buildings; and 6) the construction of private buildings. While a more extensive set of criteria, both of these studies focus on the permanence of the settlement and commitment to staying long-term in a new area. This emphasizes that, while research shows that families tend to rebuild in the same way in the same location, if they establish themselves in the new location and show a dedication to living there long-term, embodied by investing in and modifying their property, then the resettlement is a success.

It is important to note that, for many of the reasons already discussed, the success rate of resettlement is incredibly low (Oliver-Smith 2010), and most research that considers the emotional and physical impacts of resettlement advises against resettling communities. Those studies suggest that the only circumstance where communities should consider resettlement is when the city cannot mitigate the risk to an acceptable level in any other way (Cernea 2000; Oliver-Smith 1991; Partridge 1989; Perry and Lindell 1997). Even when cities or substantial sub-areas within cities choose to resettle, often the new city is abandoned and the old city is almost immediately repopulated (Oliver-Smith 1991). Dynes (1991) argues that it is extremely difficult to find any case of resettlement solely for the sake of mitigation that was successful, although often the governmental accounts will describe them as victories, emphasizing updated mitigation technologies while ignoring social disruption attributed to resettlement.

Community engagement.

Often, due to the nature of cities as “growth machines,” a few individuals monopolize decision-making power within a community during non-disaster times (Molotch 1976). In contrast to this normal functional order, the post-disaster functioning of a community turns to providing relief to victims and trying to return services to some level of adequate provision as quickly as possible. This might include providing temporary shelter, rebuilding infrastructure, and offering financial assistance. If the community is no longer able to provide or sustain a growth potential or even to provide a modest level of well-being and safety for residents, its desirability

as a place to live declines and relocation or resettlement could become a possibility. As suggested by migration models discussed, this social disruption would need to reach a threshold (albeit rapidly at times in a disaster) for community residents and decision-makers to consider this post-disaster option.

The main point of consensus among the case studies is the importance of community engagement in the resettlement process (Bates 1982; Berke and Campanella 2006; Fraser *et al.* 2003; Iuchi 2010; Oliver-Smith 1991; Perry and Lindell 1997; Perry and Mushkatel 1984; Rubin and Barbee 1985; Smith 2011:239; Smith and Wenger 2007:241). Oliver-Smith (1991) suggests that this is not just a recommendation, rather a requirement for a successful resettlement. He states that governments should consider planning "with the people rather than for the people" to reflect the needs of the community, regarding both culture and production and consumption patterns.

Berke and Campanella (2006) suggest that involving the community helps residents understand their options and develop more support for mitigation measures. Bates (1982) also supports this statement, suggesting that community participation is more important than a highly organized governmental response. This is not a shallow involvement or simply a single committee. Perry and Mushkatel (1984:193) suggest that individuals should be involved in every aspect of the resettlement decision-making process, ranging from site selection and reconstruction to post-resettlement assessments of community well-being.

Berke, Wenger, and Kartez (1993) suggest that the degree of integration of a community, both horizontally and vertically, has an impact on their recovery process. Horizontal integration refers to the ties between organizations and individuals within the community, and suggests an egalitarian power relationship. Vertical integration extends beyond the community to include links to outside organizations and government. There are inherent power inequalities in these relationships. Horizontal integration helps to ensure that community needs are recognized and vertical integration assists in receiving outside resources. Berke, Wenger, and Kartez suggest that these two forms of integration are interdependent and, with both, communities can better advocate for their needs in disaster recovery.

Emergent groups often facilitate horizontal integration. As defined by Stallings and Quarantelli (1985), emergent groups are newer organizations that lack formalization and tradition and form to address community issues that the formal system does not adequately recognize. Since these organizations form within the community by citizens, Smith (2011:239) notes that emergent groups often have unique insights on community needs. As an example, the emergent group, “Women Will Rebuild,” formed following Hurricane Andrew due to a perceived lack of attention paid to women and children’s issues during the recovery period. This group convinced the local recovery organization (“We Will Rebuild”) to create subcommittees to address their concerns (Smith 2011:252).

Emergent groups can also help facilitate vertical integration. Since the community recognizes emergent groups as community insiders, this grants them a

trustworthy status that they can use to help engender community support (or opposition) for mitigation measures (such as resettlement) (Smith 2011:242). When a study recommended converting the Broadmoor neighborhood to open space following Hurricane Katrina (a top-down resettlement effort), the neighborhood formed the Broadmoor Partner Network with the explicit task of proving that the community was viable through a redevelopment plan (Smith 2011:117). The group effectively utilized horizontal and vertical integration to assess and meet local needs while helping displaced residents return to their homes.

Proposition 11: Policy is the product of multiple interested parties working toward a common goal. Without buy-in from these stakeholders, it is highly unlikely that new policy will be instated or that voluntary resettlement will be achieved.

Proposition 12: The existence of and work of emergent groups may affect residential decision-making.

Planning.

Numerous scholars suggest that establishing recovery plans prior to an event that specify plans for relocation can improve resettlement outcomes (Berke and Campanella 2006; Correa 2011; David and Mayer 1984; Fraser *et al.* 2003; Mader 1980; Mileti and Passerini 1996; Tobin 1992). Berke and Campanella (2006) suggest that communities can use recovery plans to “identify sites free of hazards to serve as relocation zones for developments in hazardous areas that are likely to be significantly damaged during a disaster.” Since, as noted earlier, pressure to return to normalcy

creates a short window of opportunity, pre-identifying relatively safe zones for rehabilitation enhances the chances that relocation will occur (Berke and Campanella 2006).

Smith (2011:65) notes that after Hurricane Fran and complications resulting from the related buyout program, Kinston, NC developed a HMGP application in anticipation of future storms. When Hurricane Floyd struck three years later, the city was able to use this application to respond more quickly to incorporate the resulting buyouts with other recovery activities. In a similar case, Mader (1980) noted that, following the 1968 earthquake in Santa Rosa, CA, the town could link much of the success in recovery to a recovery plan they approved roughly one year before the earthquake. This plan specified changes in land use and a revitalization for the downtown area that would have been difficult to implement if it were not for a disaster. In Soldiers Grove, WI, prior discussions and planning efforts set the stage for the resettlement efforts. Due to the rundown state of the downtown area, groups of citizens were already planning to relocate the downtown area prior to the flooding (David and Mayer 1984).

As desirable as these plans may seem, they are often either weak or do not exist. Berke, Kartez, and Wenger (1993) suggest that planning for disaster events may not receive attention due to the low frequency of disasters. Even when in place, Berke and Campanella (2006) note that most local planning efforts are weak and do not receive proper state and federal support. Hastily assembled resettlement plans that do not receive public input often fail, and people revert to prior settlements (Mileti and

Passerini 1996; Tobin 1992). In addition, plans that take too long to develop or implement are often less likely to succeed due to a loss of support (Fraser *et al.* 2003; Mileti and Passerini 1996).

Proposition 13: The nature of, or lack of, recovery and resettlement planning may affect resettlement outcomes.

Housing.

Four main elements recur in the literature regarding resettlement housing that are a necessity for a positive resettlement outcome: 1) the appropriateness of temporary housing, 2) fair compensation for lost housing, 3) availability of housing, and 4) appropriateness of housing. The cultural and functional appropriateness of temporary housing during the relocation process will have an effect on community well-being, which may cause attrition rates to increase before relocation is complete (Perry and Lindell 1997). In Japan following the 2011 earthquake and tsunami, the government assigned temporary housing determined through a lottery system. What this effectively resulted in was a destruction of neighborhood ties. Because of this disruption to the social fabric, deaths among the elderly (known as “lonely death”) increased because community members were not able to care for the elderly as they were prior to the event.

When considering compensation, it is critical to not only pay homeowners fair value for their home, but market replacement value so they have enough to buy an equivalent home (Badri *et al.* 2006; de Vries and Fraser 2012; Fraser *et al.* 2003; Miller 2012:28; Padree 2012:63; Paul *et al.* 2007). In Greensburg, Kansas, most of the

homes were older and had devalued over time. Following an outbreak of tornadoes in 2007 that destroyed much of the town, the compensation they received for these older homes was woefully inadequate and did not allow them to relocate to the area the city had planned for resettlement. On average, homeowners received one-third of the funds necessary to buy an equivalent-sized home (Paul *et al.* 2007). Following Hurricane Katrina, there was a shortage of low-income housing rebuilt, which in many cases essentially kept low-income individuals from returning to New Orleans. On average, low-income housing rent increased by 35% (Padree 2012:63). Bardi (2006) also suggests compensation at replacement value for all losses, whether an individual owned their building or rented, as well as compensation for lost wages and displacement costs. As an example of this need, rent increased following the Greensburg tornado, from an average of \$335 to \$750 dollars per month (Paul *et al.* 2007).

Planners also must consider not only the price but also the appropriateness of the housing. When reconstructing an entire town, one suggestion is to build core houses quickly (to address attrition related to a lengthy displacement), and allow people to modify the property to suit their individual physical and aesthetic needs. As they do, this will show that necessary permanence which was discussed as a sign of success. By leaving these homes open to additions, it also addresses concerns regarding whether the home is large enough for extended families (Oliver-Smith 2010). In the case of the 1970 Gediz earthquake in western Turkey, in one year

homeowners expanded over 90% of the houses in the resettled area (Oliver-Smith 2010).

Proposition 14: The process and both positive and negative events from the moment of displacement to the beginning of resettlement may affect household residential decision-making.

Proposition 15: The availability of affordable, appropriate housing may affect resettlement outcomes.

Financial incentives.

Resettling is more than just rebuilding structures; Partridge (1989) suggests that it is crucial to establish social and economic systems of production swiftly during the transition period. Developing the economic engine and offering employment, especially employment opportunities that were not previously available, will attract people to the new settlement (David and Mayer 1984; Oliver-Smith 1991; Perry and Mushkatel 1984:157). It may even affect the success or failure of a resettlement project. Following flooding in Malaysia, Chan (1995) found that families were not willing to move unless the government promised both land and employment.

Financial incentives are a second effective way to entice families to resettle. There is also a temporal element to consider. Paul *et al.* (2007) suggest that the success of resettlement may depend on the speed at which government offers incentives to resettle. These could come in the form of tax breaks, new employment opportunities, or discounts on new housing (Iuchi 2010).

Following a major flood in 1978, Soldiers Grove, Wisconsin fully committed to a voluntary resettlement project that began in 1976 (David and Mayer 1984). The alternative was for the Army Core of Engineers (ACE) to build a new levee, which the town felt was too costly. David and Mayer (1984) note that the levee installation cost was over three times that of the property it would have protected. Since the town was in a floodplain, Wisconsin flood zoning laws prevented the city from spending more than 50% of the value of the property on renovations. David and Mayer suggest that the town would not legally be able to repair the business district to an acceptable level, which calls into question whether this was a voluntary or involuntary resettlement.

Researchers often refer to Soldiers Grove as a resettlement success story (Becker 1983; David and Mayer 1984). They drastically reduced flood exposure for much of the business district, property value increased, the tax base increased by two million dollars, the population grew from 530 to 616, and they decreased fossil fuel reliance by requiring solar panels on new businesses (David and Mayer 1984; Tobin 1992). What these studies ignore, however, are the social aspects of a resettlement effort. Tobin (1992) notes that, based on a survey of residents, people generally were not happy with the move. Approximately 70% of respondents felt that the advantages of resettlement did not outweigh the negative outcomes. Residents often noted problems with accessing the new downtown area, a lack of community spirit, and a decline in general services as major post-resettlement issues, rating the community as a worse place to live.

Proposition 16: Financial incentives offered may affect household residential decision-making.

What Is Missing?

The literature review above is a summary of a body of knowledge with a handful of controversial models and best-practice case study narratives. With that said, there are a number of research needs in this field. Only a small portion of the recovery literature spends any time discussing household residential decision-making, and most studies focus on small communities. Due to the scope of these studies, researchers do not understand how families make these decisions, what is important to them, and the role and effectiveness of planned policy and action in residential decision-making process. The literature is fundamentally bifurcated: the U.S. literature focuses on planning, while the international literature focuses on attachment to place and cost-benefit analysis. While the literature outside the U.S. is helpful in understanding some concepts related to residential decision-making, there may be underlying limitations when applying these concepts to U.S. case studies. The combination of negative outcomes, current utilization of relocation, and a lack of literature in this area demands further research. Table 4 is a collection of the propositions offered in the literature review.

Table 4: Propositions From the Literature Review

Proposition Number	Proposition
Proposition 1A	Federal, state, and local policy may affect household and community residential decision-making.
Proposition 1B	Knowledge of FEMA’s HMGP funding may be an important influence in this process.
Proposition 1C	Knowledge of HUD’s CDBG funding may be an important influence in this process.
Proposition 2	The availability and perceived voluntariness of buyouts may affect household residential decision-making.
Proposition 3	Resettlement may result in increased levels of physiological, psychological, and sociocultural stress for household members.
Proposition 4	Attachment to place may affect household residential decision-making.
Proposition 5	The level of damage to the physical environment may affect household residential decision-making.
Proposition 6	Household income and access to resources may affect household residential decision-making.
Proposition 7	Minority status may affect household residential decision-making.
Proposition 8	Household risk perception may affect residential decision-making.
Proposition 9A	Pre-existing, negative conditions may affect post-disaster residential decision-making.
Proposition 9B	Pre-event disaster recovery planning may facilitate community resettlement.
Proposition 10A	Demographic differences among households may affect residential decision-making.
Proposition 10B	Differences in trust in governance among households may affect residential decision-making.
Proposition 11	Policy is the product of multiple interested parties working toward a common goal. Without buy-in from these stakeholders, it is highly unlikely that new policy will be instated or that voluntary resettlement will be achieved.
Proposition 12	The existence of and work of emergent groups may affect residential decision-making.
Proposition 13	The nature of, or lack of, recovery and resettlement planning may affect resettlement outcomes.

Proposition 14	The process and both positive and negative events from the moment of displacement to the beginning of resettlement may affect household residential decision-making.
Proposition 15	The availability of affordable, appropriate housing may affect resettlement outcomes.
Proposition 16	Financial incentives offered may affect household residential decision-making.

Chapter 3

METHODS

Duncan, have I not told you that when you think you know something, that is a most perfect barrier against learning?

- Frank Herbert

To explore my research question and my propositions, I utilized an explanatory, embedded, multiple case study methodology to explore residential household decision-making in one community in New York and one in New Jersey. I considered households in a community and policy environment, acknowledging that the decision-making process is complex and interdependent. For that reason, I also conducted a review of the policies to set the environment in which people rebuild and buyouts occur. The following methodology section splits into two sections: case study methodology and data collection techniques. Data collection techniques include a policy review, questionnaire, and in-depth interviews with households and individuals involved in the development of policy related to housing recovery, relocation, and resettlement. This section closes with a discussion of sampling logic and criteria for respondent/interviewee inclusion and exclusion.

Case Study Methodology

While there are many definitions and examples of case study methodology within the qualitative literature, most have similar core features. Essentially, an

academic research case study is a research method that utilizes multiple sources of data to create a detailed examination of an event that can utilize and help develop theory (Berg and Lune 2012:325; Patton 2002:447; Schramm 1971; Yin 2009). The “event” in question, as defined by Patton (2002:447), is a “critical incident...that can be defined as a specific, unique, bounded system”. The opportunity to use multiple data sources to explore an event gives case study methodology a large-scale, holistic view of a defined event that researchers can utilize to explain causal relationships that other methodologies cannot (Schramm 1971; Yin 2009).

Case study methodology is a logical methodological choice for my research for multiple reasons. Yin (2009) suggests that case studies are appropriate when “how or why questions are being asked about a contemporary set of events, over which the investigator has little or no control.” My research topic satisfies all three of these requirements. The research question asks “how” households and policymakers generate decisions, it explores an ongoing phenomenon, and I have no control over the process. In addition, as noted in the literature review, there is not a rich history of research in the case of relocation or voluntary resettlement, much less the decision-making process. Berg and Lune (2012:328) suggest that case study methodology is typically associated with building theories, not testing established theories. There is also precedence for this in the literature. Many of the studies presented use case study methodology and interviews. More specifically, when researching relocation following a flood, Perry and Mushkatel (1984) used case-study methodology,

conducting interviews with households and key officials involved in the resettlement effort to understand the process.

The case study I built is an explanatory case study. As stated by Berg and Lune (2012:337), an explanatory case study “attempts to discover and analyze the many factors and conditions that can help us to build a causal explanation for the case.” The purpose of this research is to understand the decision and sense-making processes related to relocation and resettlement and gain insights on what differentiates households who make antithetic decisions about where to live when facing similar risks. When exploring this multifaceted process, I am building a theoretical causal model to explain the process that leads to these alternative decisions.

To understand how households decide to relocate and resettle or rebuild in situ, I need to examine both cases where a majority of a community decided to resettle and areas where an overwhelming majority of the community members decided to rebuild in situ. Yin (2009) suggests that selecting a small number of cases to compare is useful for comparing two different patterns of theoretical replications. For this reason, I am used a multiple case study design. As an added benefit, this comparison allows me to lessen concerns about the uniqueness of any specific case.

Based on my research question, propositions, and the data used to address those inquiries, I employed an embedded case study approach. Three sources provided the data for my study: policy documents, households, and key stakeholders in the policy process. Taken together, I used these data sources to construct an understanding of how households decided to relocate, resettle, or stay and rebuild. By summarizing

policies regarding recovery and relocation/resettlement and interviewing individuals involved in the development of policy and the implementation of existing policy, I developed an understanding of the conditions, incentives, and context in which households decided, and are deciding, to stay or move. This provides a more holistic view of their decision-making process. Including communities from both New York and New Jersey also allowed me to capture differences between the states, exploring the effect of differing state policies on the process. It is important to note that, when conducting qualitative research, the researcher is the primary data collection tool. While I collected the information and documents, I used multiple techniques to acquire the necessary data from the above units of analysis to build into case studies.

Data Collection Techniques

Yin (2009) suggests not using random sampling logic when selecting cases. With this in mind, I used a “two-tail” design that allowed me to choose cases that fall on the extremes of the phenomenon; that is communities that, when considered as a whole, relocate and resettle and communities that rebuilt in situ. This method is useful because it allows for replication of methods and comparison of findings both within and between groups while allowing for maximum variation. This also allows me to consider the potential effects differing state and local policies as well as local disaster experiences may have on the communities. Since this study focuses on residential decision-making, I selected cases that take drastically different stance regarding relocation and resettlement post-Sandy. These cases have comparable mean gross incomes, population size, and demographics. Sites for study include Oakwood Beach

in Staten Island, NY and Sea Bright, NJ, and I describe their setting and hazard exposure in later subsections of this chapter.

To compensate for weaknesses inherent in specific research methods and as a part of a partnership with local government in Sea Bright, I used a concurrent triangulation approach (a common approach in mixed methods research) to build case studies (Creswell 2009:213). The strength of this approach is that it allows the researcher to build two databases of knowledge concurrently and then compare findings (called mixing findings) following the analysis phase of research to look for similarities or differences, also known as confirmation, disconfirmation, validation, and corroboration, in the findings. I did not weigh my findings: I considered the quantitative and qualitative findings equally during interpretation, and discussed any sources of conflict in the data in the analysis and findings section in an effort to maintain transparency (Creswell 2009:213). To present a coherent narrative for the reader, I discussed both methods separately to detail the approaches used, beginning with the questionnaire followed by the semi-structured interviews. I did, however, present both sets of findings together in a synthesized findings section and discuss the implications of those findings in one section to emphasize the similarities and differences in the findings. Figure 2 is a slightly altered version of a graphic presented by Creswell (2009:210) that visually represents the concurrent triangulation design process I employed in this study.

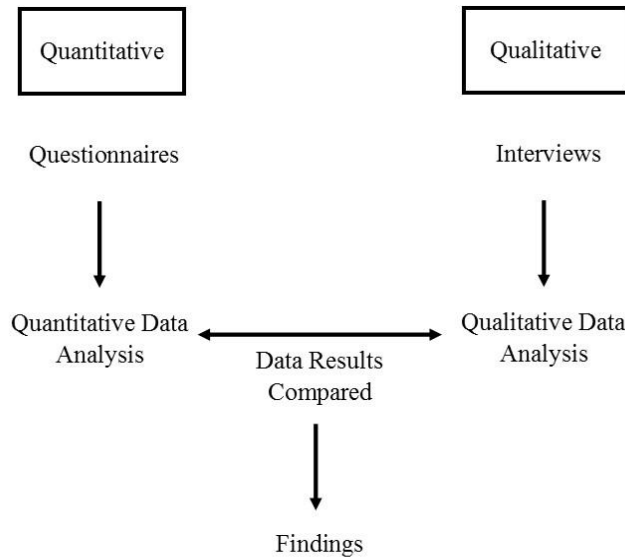


Figure 2: Concurrent Triangulation Design (Modified from Creswell 2009:210)

Policy review.

Since the strength of case study methodology is the reliance on multiple sources of data, I used three data collection techniques: a review of policy, questionnaires, and in-depth interviews. By policy, I am referring to “a course of government action or inaction in response to public problems” (Kraft and Furlong 2009). The policy suite reviewed included current federal policies on post-disaster recovery and state-level plans for federal funds dispersed following Hurricane Sandy, with an emphasis on relocation, resettlement, and buyouts. In an effort to not limit my search, I included existing policies and programs related to recovery, mitigation, relocation, and buyouts. My sampling method for the policies is simple: I conducted an exhaustive review of documents pertaining to these issues. I obtained these data from internet searches of the Library of Congress, state and local government

websites, and key informants within these levels of government during the interview process.

Questionnaires.

A mailed, self-administered questionnaire was conducted for each of the case study sites. As noted by Bachman and Paternoster (2008:205), questionnaires are an effective research method because they can collect a large amount of data on any number of topics at a relatively low cost. The impetus for a questionnaire originated from a preliminary site-evaluation trip to Sea Bright in November of 2013. At the time, the town leadership presented a plan for what their town would look like in year 2020, and noted that they needed a wealth of housing data following Hurricane Sandy to assess, among other issues, the current state of the housing stock. After conversations with the local leadership, questionnaire development began in early December, conceptualized as a cooperative effort between the Disaster Research Center and the Boro of Sea Bright.

A questionnaire was sent via the United States Postal Service (USPS) to each household within both Oakwood Beach and Sea Bright. The list of addresses within Oakwood Beach was purchased from USADATA on January 22, 2014, a service that typically provides addresses for circular mailers. The addresses were chosen by selecting a point on the map (in the center of the buyout area) and choosing a radius beyond which to draw a circle. Figure 3 provides a visual representation of the 0.3-mile radius circle within which the questionnaires were distributed. Streets outside the buyout zone were included in the study to capture the perspective of households with

similar experiences that were not eligible for the buyout program. The final mailing list included 281 entries. Assuming that media reports are correct and a majority of the residents in Oakwood Beach that were offered buyouts did accept their offers and ultimately move, this mailer relied heavily on USPS forwarding services (Barr 2013, Gregory 2013; Kosh 2013).

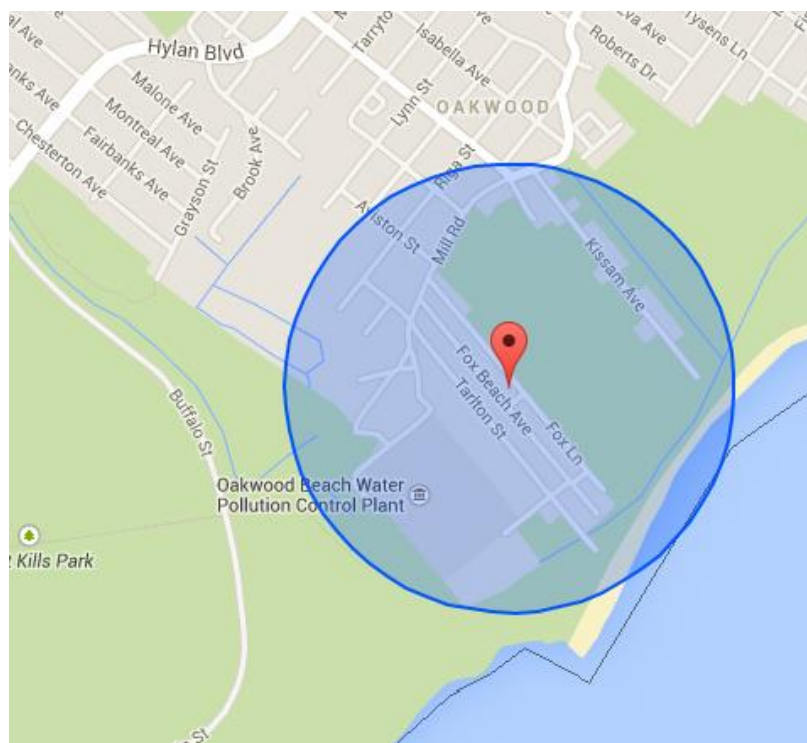


Figure 3: Map of Mailing Area for Oakwood Beach

The Sea Bright address list came from a key informant within Sea Bright and consisted of a database constructed by merging and cleaning a voter registration list (714 entries), an owner-occupied tax list (575 entries), and a tax list that included both

renters and owners (1076 entries). Duplicate addresses were deleted prior to mailing. Addresses outside of Sea Bright were included in the mailing list due to the predicted prevalence of second homes in the area. The final list contained 1254 entries, including 86 addresses outside of Sea Bright and 35 post office boxes.

Using a slightly modified version of Dillman's (1978) methodology, Vistaprint, a printing service, mailed a postcard on April 29, 2014, to each household on both of the mailing lists. This postcard served to inform the residents of the study and provide them with contact information for the researcher in case they had questions regarding the research. Three waves of questionnaire packets followed the postcards. Each questionnaire packet contained the following pieces; 1) a cover letter that described the researchers, the project, the importance of the data, and provided residents contact information for the researchers and the institutional review board for questions, 2) a copy of the questionnaire, and 3) a self-addressed, prepaid return mailer.

While the questionnaire remained unchanged, the cover letter changed slightly for each wave. In the wave two packet, the cover letter contained language that noted that a previous attempt was made. In order to reinforce the importance of hearing from a range of respondents, the cover letter for wave three noted that this was the final chance to participate, and that the researchers were particularly interested in unique and different opinions. This language was also chosen in response to three separate phone calls made to the researcher by residents from Sea Bright indicating that they had not returned the questionnaire, but they had strong opinions about the

prioritization in the recovery effort within the town, and that they felt they were in the minority.

Before each subsequent round of questionnaires, the mailing list was altered, removing households that had completed and returned their questionnaires and uncompleted questionnaires that USPS returned as undeliverable. A five digit coding system was used to keep track of returned questionnaires, using the first letter in the name of each case study site followed by four numbers (ex –O0021 or S1034). Table 5 shows the mailing schedule and return rate. When taking out potential respondents that never received their questionnaire due to an incorrect address or issue at the post office, Oakwood Beach residents returned 22.4% of their questionnaires, and Sea Bright residents returned 29.8% of their questionnaires.

Table 5: Postcard and Questionnaire Mailing Schedule and Return Rate

<i>Wave</i>	<i>Oakwood Beach, NY</i>			<i>Sea Bright, NJ</i>		
	Mailed	Completed	Return to sender	Mailed	Completed	Return to sender
<i>Postcards</i>	282	N/A	N/A	1252	N/A	N/A
<i>April 29, 2014</i>						
<i>One</i>	282	22	26	1252	132	142
<i>May 12, 2014</i>						
<i>Two</i>	234	23	10	978	106	61
<i>June 3, 2014</i>						
<i>Three</i>	201	9	5	811	65	33
<i>July 2, 2014</i>						
<i>Final counts</i>	282	54	41	1252	303	236

The questionnaire contained 75 questions for Sea Bright and 80 for Oakwood Beach. Five questions were Oakwood Beach-specific because residents of Sea Bright

did not have a buyout option. The questionnaire asked respondents about their homes, mitigative actions undertaken following Hurricane Sandy, and explores concepts that past research noted as important in the decision-making process along with novel concepts not explored in prior research. Where possible, the questionnaire adapted measures from previous studies that proved to be valid measures of similar concepts (Bachman and Paternoster 2008:208). The instrument included a number of different question types, including multiple choice, four and five point Likert-scale, indexes, fill in the blank, and open-ended questions. Table 6 serves as a summary of the content included in the questionnaire. The instrument was pre-tested on residents of Newark, DE and received input from officials and representatives from non-governmental organizations (NGOs) from Sea Bright.

The questionnaire consisted of twelve separate content sections. Each section elicited responses to collect data on a different concept or item of interest to the researcher and/or the Boro of Sea Bright. The first six questions collected general residential data, asking residents about their tenure in their community and their housing type.

Table 6: Questionnaire Structure

<i>Questions*</i>	<i>Content</i>
1-6	Residential data
7-12	Place identity and place dependence
13-14	Pre-event functioning and place attachment
15-19	Condition of housing and plans for mitigation
20-25	Damage and insurance coverage
26-29	Travel disruption
30-32	Residential status
33-36**	Buyout decision and reasoning
37-57 (33-52)***	Variables influencing decision
58-59 (53-54)	Post-event functioning
60-66 (55-61)	Risk perception
67-76 (62-71)	Demographics
77-78 (72-73)	Copy of results and contact information for follow-up interview
79-80 (74-75)	Open-ended questions regarding process and pitfalls

*Numbering for Sea Bright when the two numbering systems diverge is in parentheses.

**Oakwood Beach-specific

***One item in this section, exploring the importance of the trustworthiness of the buyout organization in the decision-making process, was only asked to residents of Oakwood Beach

Two types of questions were used to measure attachment to place. First, six questions on a five-point Likert scale based on studies from community psychology (Raymond, Gregory, and Weber 2010; Semken, Neakrase, and Dial 2009; Williams and Vaske 2003) measured place identity and place dependence. This set of questions asked respondents to indicate their agreement with a statement regarding their connectedness to their area, ranging from “strongly agree” to “strongly disagree”.

While previous studies of disasters have not included this Likert-style indicator or any numerical measures of attachment, it proved to be an important measure since it gave

post-disaster levels of attachment that could easily be analyzed quantitatively. There is also value in testing proven indicators in new settings. As a second measure of attachment to place previously used in a disaster context, respondents were also asked to list the three things they liked most and least both pre- and post-Sandy as indicators of the respondent's perception of pre- and post-event functioning and their attachment to their community (Fraser *et al.* 2003).

The following section probed the current condition of the housing, mitigation undertaken since Sandy, planned mitigation, and the funding source for mitigative activities. In each section, respondents were asked to mark all that applied and given space to elaborate on their responses. While discussing the condition of their homes, respondents were asked to indicate the level of damage to their homes and their community on a four point Likert scale ranging from "no damage" to "very extensive damage", and to provide a numerical estimate of their damage. Respondents were also asked if they were carrying a flood insurance policy at the time Hurricane Sandy occurred, and how much it paid out.

A novel approach measured disruption attributed to the event. Respondents were asked if disruption resulting from Hurricane Sandy affected their ability to travel within their community for everyday activities (ex – go to work, church, the post office, the grocery store, etc.) and their ability to travel outside their community. If they answered yes to either question, a follow-up question asked them to indicate how long damage disrupted their travel, ranging from less than a week to more than a year.

A set of three questions measured the dependent variable. The questionnaire asked respondents to indicate whether they lived in the same community, at the same address, and how long they thought they would live at their current address (with the response choices of less than one year, one to five years, and more than five years). This set of questions allowed respondents to not only indicate whether they had moved or not following Sandy but also added more depth to our understanding how they viewed the bounds of their community and their permanency in their setting. This added depth is a strength of this study. While the first question is unambiguous, the second implicitly asks the respondent to define the bounds of their community, which is important when the literature suggests that people are attached to communities as well as homes. The third question also gives residents space to express their ambivalence on their residential status in a home.

Since New York State offered many of the residents of Oakwood Beach a buyout, which was not an option in Sea Bright, only residents of Oakwood Beach were asked questions about buyouts. Residents of Oakwood Beach were asked if they had received a buyout offer for their homes, the name of the organization that made the offer, their decision on the offer, and for an explanation for their reasoning. Asking for the name of the organization gave insights on how the buyouts were presented to households by ProSource Technologies, a Minnesota-based firm contracted by the state of New York to run the program, and whether other individuals were offering money for homes in the area.

A panel of questions asked respondents to indicate how important a number of elements were when deciding where to live following Sandy. These questions were on a four point Likert scale, ranging from “not important at all” to “very important”. The questions included:

- the likelihood of another hurricane (Kirschenbaum 1996),
- concerns over sea level rise,
- being close to family (Myers, Slack, and Singelmann 2008), friends (Fraser *et al.* 2003), employment opportunities (Palacio 1982:123), and the beach,
- access to affordable housing (Iuchi 2000),
- family history in the area (Shriver and Kennedy 2005),
- opinions of neighbors (de Vries and Fraser 2012),
- concerns about going into debt (Fraser *et al.* 2003),
- changes in where homes can be built, insurance rates, and building codes,
- their ability to travel easily within and outside of their community,
- financial incentives to rebuild in the same community or a new location from the government (aid programs) (Fraser *et al.* 2003),
- help from other organizations (such as a local church or civic group) (Smith 2011:239), and
- the trustworthiness of the buyout and community leaders (Perry and Lindell 1997).

The literature regarding relocation and resettlement suggested that a majority of the items listed above played some role in that decision-making process. Additional items were added to broaden the knowledge base and explore concepts that logically may be a part of the decision-making process but were not included or mentioned in write-ups of previous studies.

Aside from asking about the importance of the likelihood of another hurricane, this questionnaire contained another section to measure risk perception, broken down into risk of recurrence and potential impacts. To measure their perception of risk of recurrence, respondents indicated if they strongly agreed to strongly disagreed on a

four-point scale that an event of similar magnitude to Sandy would affect their community in the next five years, the next ten years, the next twenty years, or never again (Turner, Nigg, and Paz 1986; Tierney and Sheng 2001). Using a panel of questions adapted from Lindell and Hwang (2008), respondents indicated their perceived personal risk by noting the likelihood of damage to their home, injury to themselves or members of their household, and resulting health problems to themselves or members of their household on a four point Likert scale, ranging from “Not Likely at All” to “Very Likely”. Lindell and Hwang note that this operationalization follows extensive literature on seismic hazard assessments.

In an effort to provide some benefit back to the households that participated in the questionnaire and increase transparency, respondents were asked if they would like a copy of the research results and for an e-mail address if they were interested. To create a sampling frame for semi-structured interviews detailed in the next section, respondents were asked if they were available for a follow-up interview and, if they indicated they were interested, for their contact information.

Noting that questionnaires limit the range and depth of responses, two open-ended questions were included at the end of the questionnaire to capture the process of housing recovery. Respondents were asked to list the steps they went through when recovering from Hurricane Sandy and to list any pitfalls or the problems respondents encountered while recovering from the hurricane. Open-ended questions were chosen instead of offering a set of responses for the respondent to choose from for these final

questions to allow for a range of responses and experiences (Bachman and Paternoster 2008:208).

Analysis plan.

Data management.

When respondents returned the questionnaires to the researcher, the questionnaire was checked into an excel file that contained an up-to-date list of the status of each potential respondent. The data was then input into a Statistical Package for the Social Sciences (SPSS) file, which was stored on a secure file folder on the DRC server. Given the exploratory nature of this study, the analysis of the quantitative data focused on three areas:

- 1) finding significant relationships between the dependent variables and the independent variables,
- 2) exploring the strength of the relationships found in step one, and
- 3) understanding the extent to which knowing the value of an independent variable reduces the error in predicting the value for the dependent variable.

To put this into simpler language, this analysis focused on understanding which variables play a part in the household residential decision-making process, how relatively strong that relationship is, and how important it is to know how they consider that factor when deciding where to live following an undesirable event.

SPSS analysis.

To understand the distribution of each variable, summary descriptive statistics were calculated to explore patterns and variations in the data. In each analysis section,

descriptive statistics are reported where appropriate, and Appendix D contains a summary table of all the variables. After examining the variance in responses, the researcher collapsed a selection of the variables into smaller answer categories, which are more appropriate for statistical analysis, discussed in the Analysis Chapter.

The first goal of the analysis with this dataset was to understand what relationships are and are not significant. Due to the nature of the variables tested, the chi-square inferential statistical test (χ^2) was used to test the null hypothesis, which posits that there is no statistical relationship between two variables (Miethe and Gauthier 2008:188). Since the dataset primarily contains nominal and ordinal independent variables, three nominal dependent variables, and two ordinal dependent variables, chi-square offers a way to check for significant relationships across these variable types. The null hypothesis is true if the observed cell frequencies are the same as the expected cell frequencies, and false if the observed cell frequencies are not equal to the expected cell frequencies. The chi-square test looks at this difference in observed versus expected and the degrees of freedom for a given table to see if the relationship between two variables is significant at a given alpha level (0.05 for this study). With these guidelines, using the chi-square value and rejecting the null hypothesis indicates that there is a 95% probability (based on the alpha level) that the association between two variables is not due to chance. To put it another way, there is only a 5% chance that we incorrectly rejected the null hypothesis suggesting that there is no association between the variables.

The second goal of this portion of the research is to understand the strength of identified relationships. Phi is a measure of association based on chi-square used for nominal-nominal, nominal-ordinal, or ordinal-nominal data that have exactly two possible values. This test considers the strength of the relationship between the variables in question on a scale of 0.00 (no association) to 1.00 (complete association) by dividing the chi-square score by the number of respondents (n) and taking the square root of that number, thus eliminating the effect of sample size, which can inflate the value of chi-square. For tables larger than 2x2, Cramer's V Coefficient (V) was used instead of Phi, but is interpreted in the same way. The directionality is understood by examining the crosstabs output table. For the purposes of this study, Phi and Cramer's V Coefficient were interpreted as follows:

- < |0.10| is a negligible association,
- |0.10| and under |0.20| is a weak association,
- |0.20| and under |0.40| is a moderate association,
- |0.40| and under |0.60| is a relatively strong association,
- |0.60| and under |0.80| is a strong association, and
- |0.80| and under |1.00| is a very strong association.

The last goal is to understand how much knowing the value of one independent variable improves accuracy when predicting the value the dependent variable.

Goodman and Kruskal's tau provides a proportional reduction in error (PRE) score between nominal-nominal, nominal-ordinal, or ordinal-nominal variables. Tau calculates the percent of relative improvement in predicting the value of the dependent

variable by knowing the value of the independent variable over simply guessing. The value of Tau ranges between 0.00 (no additional predictive power) to 1.00 (perfect predictive power). For example, a tau value of 0.018 indicates that knowing the value of the independent variable increases the chances of correctly guessing the value of the dependent variable by 1.8%, versus pure guessing.

For ordinal-ordinal comparisons, Goodman and Kruskal's gamma is a PRE measure that ranges from 0.00 (no association) to ± 1.00 (complete association). A positive relationship suggests that as the rank of independent variable increases or decreases, so does the rank of the dependent variable. A negative relationship, for example, suggests that as the rank of the independent variable either increases or decreases, the rank of the dependent variable trends in the opposite direction. While the gamma value is interpreted in much the same way as tau it is interpreted, gamma tends to produce larger values than tau. The values are larger because instead of predicting a point value gamma suggests that data trends together. Gamma can predict that, for example, higher values in one variable are related to higher values in another variable (concordant) or that higher values in one variable are related to lower values in another variable (discordant). A gamma value of .252, for example, suggests that knowing the value of the independent variable increases the odds of predicting the rank (not value, since this is ordinal data) of dependent variable by 25.2%, versus pure guessing, and that the two variables are a concordant pair. As the value of gamma approaches 0, the odds of incorrectly predicting the rank of the dependent variable increases.

Methods to ensure quantitative data quality.

To help ensure the accuracy of data input, the researcher created the SPSS file, built a codebook for data entry, and manually input a portion of the questionnaires to ensure the SPSS file worked as intended. A randomly selected 5% of the questionnaires were selected and screened at the conclusion of data collection to check for errors in data input. An undergraduate researcher input the remaining portion of the questionnaires. Paper copies of the questionnaires were retained in a secure location, and the SPSS file was versioned and copied each time the researcher input data to increase redundancy and reduce the chance of a catastrophic data loss.

There are inherent threats to validity and reliability in quantitative studies that must be acknowledged. First, response bias is an evident threat to validity. This issue is especially difficult to address when looking at data at a household level, since the typical method to detect this is to compare characteristics of the respondents with the population as a whole. Since this study takes place at a household level, individual indicators and averages (like those provided by the U.S. Census) are not appropriate since the head of household that responds will likely be older and wealthier than the average citizen is. Other sources may provide some household-level indicators, such as the American Community Survey, but available data is still limited. Information on the population (at the household level, where available), however, is provided when discussing the case studies in detail in a later section.

The setting of each of these case studies is also unique, which threatens the ability to generalize to a larger setting. This is also a latent shortcoming of cross-

sectional research on a longitudinal phenomenon, where it is difficult to project findings today regarding residential decision-making to a long-term, complex process. Since this research is exploratory, focused on understanding process and identifying important decision-modifiers, and not meant to support the creation of a predictive model, many of these concerns have limited impact. It is also important to note that, as worn-out of as it may be, statistical correlation does not equate to causation. These items will be revisited in the conclusion chapter.

Semi-structured Interviews

To expound upon the data gathered through the questionnaires, I conducted in-depth, semi-structured interviews. The in-depth interviews were semi-structured since theory is rather limited in this area. This presents a few advantages over an informal, conversational interview or a structured interview. It allowed me to develop the interview questions and probes around broad areas of interest that helped keep the interviews structured enough for comparability but not so rigid that it did not allow me to pursue emerging patterns or areas of interest (Berg and Lune 2012:114). Patton (2002:448) suggests that the researcher should focus data collection on the most basic unit of analysis they can reach. Since I am interested in decision-making and motivation, I conducted these interviews with representatives from three different groups: households that decided to resettle following Hurricane Sandy, households that decided to rebuild in situ, and individuals involved in the development or implementation of recovery policies.

Interviews with residents.

To gain a fuller understanding of variation within the decision-making process, I solicited interviews from full-time residents and part-time residents as well as both homeowners and renters. When contacting residents, I ensured that the household member participating in the interview was 18 or over. If multiple individuals over the age of 18 were interested, I extended the invitation to them as well. Since the literature suggests that households make residential decisions as household units, I probed to ensure that I included the perspective of all adult members of the household. For both case study locations, I contacted interviewees the week before to schedule interviews, and followed-up with each interviewee to confirm their interview the day before interviews began at that site.

Intending to interview until conceptual exhaustion, I purposely selected interviewees in Sea Bright based on a number of factors. Due to a smaller number of responses from Oakwood Beach, I attempted to contact everyone that indicated that they would be willing to take part in an interview. After conducting preliminary analysis on the questionnaires returned between mailing waves two and three to look for trends, I noted which dependent variables initially had a statistically significant relationship with the independent variables. Since this was an early analysis and I did not want it to be the sole driver of qualitative data collection, I also made note of which variables were strongly represented in the literature but were not significant on initial analysis with residential decision-making for further exploration in interviews. With all of this in mind, I chose interviewees to maximize variation across both the

independent and dependent variables to explore a range of possible relationships.

Within Sea Bright, I created the following ideal types and contacted interviewees that indicated that:

1. a “renter” that does not live in the same community or at the same address,
2. a “renter” that lives in the same community or at the same address, and plans to reside at that address for more than five years,
3. a “single-family home” that does not live in the same community or at the same address,
4. a “single-family home” that lives in the same community or at the same address, and plans to reside at that address for more than five years,
5. a household that indicated that their primary home was not in Sea Bright that does not live in the same community or at the same address,
6. a household that indicated that their primary home was not in Sea Bright that lives in the same community or at the same address, and plans to reside at that address for more than five years,
7. a household that indicated that they were not attached to Sea Bright that does not live in the same community or at the same address,
8. a household that indicated that they were not attached to Sea Bright that lives in the same community or at the same address, and plans to reside at that address for more than five years,
9. a household that indicated that they were very attached to Sea Bright that does not live in the same community or at the same address,
10. a household that indicated that they were very attached to Sea Bright that lives in the same community or at the same address, and plans to reside at that address for more than five years,
11. a household that indicated that their travel within and outside of Sea Bright was heavily disrupted that does not live in the same community or at the same address,
12. a household that indicated that their travel within and outside of Sea Bright was heavily disrupted that lives in the same community or at the same address, and plans to reside at that address for more than five years,
13. a household that indicated that they had little to no damage to their home that does not live in the same community or at the same address,
14. a household that indicated that they had little to no damage to their home that lives in the same community or at the same address, and plans to reside at that address for more than five years, and
15. a household that’s home was abandoned or condemned.

I sorted potential interviewees based on the criteria listed above. I only called and e-mailed households in Sea Bright and Oakwood Beach to schedule interviews that indicated they were willing to participate in a follow-up interview and provided me with contact information. While 141 of the 303 respondents in Sea Bright indicated they were willing to participate in a follow-up interview, 11 did not provide contact information, reducing the potential interviewee pool to 130. Of the 54 respondents in Oakwood, 23 indicated they were willing to participate in a follow-up interview.

In both case study sites, I intended to conduct face-to-face interviews for Thursday, Friday, and Saturday time slots, scheduling interviews from 8:00AM to 8:00PM in two-hour blocks. I chose these times to try to accommodate varying work schedules. I scheduled interviews for July 31, August 1, and 2, 2014 in Sea Bright. As expected, a portion of the phone numbers provided did not work, some of the e-mails were no longer in operation, two refused to participate, and approximately half of those contacted never responded. While I tried to make every accommodation possible, there were still potential respondents that could not participate in an interview due to scheduling conflicts.

In total, I conducted five in-person interviews in Sea Bright, one with a married couple and the remaining four with individuals. I chose to conduct the interviews at the community center due to its central location, open parking, presence of a side door for discrete entry, and availability. During my time in Sea Bright, I also had a number of informal conversations with individuals around the town hall

regarding my project and their experiences. I conducted an additional nine telephone interviews with Sea Bright residents from August 11 through September 7. Table 7 summarizes the residential status of the individuals representing households I spoke to in Sea Bright based on their questionnaire responses.

Table 7: Residential Status of Interviewees in Sea Bright

<i>Interviewee</i>	<i>Do you still live in the same community as you did at the time of Hurricane Sandy?</i>	<i>Do you still live at the same address as you did at the time of Hurricane Sandy?</i>	<i>How long do you plan to live at your current residence?</i>
<i>S0032</i>	Yes	Yes	Less than one year
<i>S0044</i>	Yes	No	One to five years
<i>S0173</i>	No	No	Less than one year
<i>S0202</i>	Yes	Yes	One to five years
<i>S0387</i>	Yes	Yes	More than five years
<i>S0412*</i>	Yes	No	One to five years
<i>S0413*</i>	Yes	Yes	One to five years
<i>S0617</i>	Yes	Yes	More than five years
<i>S0691</i>	Yes	Yes	More than five years
<i>S0716</i>	Yes	Yes	More than five years
<i>S0832</i>	Yes	Yes	More than five years
<i>S0911</i>	No	No	One to five years
<i>S0932</i>	Yes	Yes	Less than one year
<i>S1051</i>	Yes	Yes	Less than one year
<i>S1254</i>	No	No	More than five years

*S0412 and S0413 were the same interviewee that owned two properties in Sea Bright

Taken as a whole, my interviewees from Sea Bright matched my ideal typology described above surprisingly well. Three stated that their home in Sea Bright was their second home, one a rental property, and the remaining ten resided primarily in Sea Bright. Five of the interviewees lived in townhouses or condominiums, and one rented a floor from another resident. Years in Sea Bright ranged from two years to twenty-six years, with an average of 12 years. Eight of the interviewees indicated that they were highly attached to Sea Bright, three indicated mild attachment to Sea Bright, and three were not attached to Sea Bright. Ten completed their repairs to their home by the time they completed the questionnaire, one abandoned their home, two were in the process of repairing their properties, and one stated that their property did not require repairs. Damage estimates ranged from no reported damage to \$390,000, with an average of \$130,000. All the interviewees indicated that Hurricane Sandy disrupted travel within Sea Bright, and only five stated that travel was not disrupted outside of Sea Bright. Three interviewees indicated that Hurricane Sandy disrupted travel within Sea Bright for seven to twelve months or longer, and four indicated that Hurricane Sandy disrupted travel outside of Sea Bright for two to six months or longer.

Oakwood Beach, in contrast, was a different experience. I planned to conduct interviews on August 7, 8, and 9 at a local Starbucks coffee shop. After attempting to contact potential interviewees for two weeks and only having two confirmations, I decided to conduct telephone interviews instead in Oakwood Beach. While face-to-face interviews are methodologically preferable due to the ability to use visual cues and easily probe interviewees, the general concerns about data quality loss (sensitive

questions, length of interview, amount of concepts covered) were minimal in this study and did not appear to be an issue (Holbrook, Green, and Krosnick 2003; Irvine 2011; Jordan, Marcus, and Reeder 1980; Newman *et al.* 2001). In addition, a number of studies call into question the assumption that face-to-face interviewing produces better data than telephone interviews (Novick 2008; Sturges and Hanrahan 2004; Wijck, Bosch, and Hunink 1998). I attempted to contact every resident of Oakwood Beach that indicated they were interested in participating in a follow-up interview four times, and attempted to acquire additional interviewees via snowball sampling.

I completed three telephone interviews with residents of Oakwood Beach. One of the interviewees (O0259) rented a home within the zone that New York State purchased through the buyout program following Hurricane Sandy. A second interviewee (O0194) lived one street away from the buyout zone, and was involved in a failed attempt to be included in the buyouts. The third interviewee (O0014) lived approximately two streets away from the buyout zone at the time of Sandy. O0259 was temporarily living in a relative's second home, and expected to move again in less than a year. O0194 felt they would live at their current residence within Oakwood Beach for one to five years, planning to leave whenever their house's value had improved. O0014 suggested that if her partner had his way, they would have already moved, but planned to move when their house's value improved.

All of the interviewees indicated that the residence in Oakwood Beach was a single-family home and their primary residence at the time of Hurricane Sandy. Years in Oakwood Beach ranged from six to seventeen, with an average of ten years. One

interviewee indicated that they were highly attached to Oakwood Beach, one indicated mild attachment to Oakwood Beach, and the third was not attached to Oakwood Beach. Only one of the residents indicated that they had completed repairs, the second property was sold (to New York State), and the last noted that they were in the process of repairs. Damage estimates ranged from \$25,000 to \$85,000, with an average of \$46,000. Two of the residents noted travel disruption within Oakwood Beach due to Hurricane Sandy, but both noted that it lasted less than a month. Only one resident noted disruption to travel outside of Oakwood Beach, but noted that it lasted less than a week.

Interviews with policymakers.

When exploring housing policy, I spoke with policymakers and enforcers at the federal, state, and local level. I chose the government agencies based on their role in housing recovery, gleaned their importance from both existing policies and snowball sampling. Since I am interested in the intent and implementation of policies, I purposely selected government personnel within each agency to interview. As noted in Patton (2002:46), purposeful sampling is ideal for selecting "...information-rich cases whose study will illuminate the questions under study." I closed each interview by asking the interviewee if they know of anyone else I should interview. Since I am primarily interested in their policies and approach to hazard management, each interviewee worked in their organization for at least one year prior to Hurricane Sandy. I conducted interviews with nine government officials involved with

developing and carrying out housing recovery policy: three in the federal government and six state and local representatives.

This was not without its own challenges too. Many agencies were not willing to talk to me, and either directly or indirectly refused my interview request. I made five attempts to talk to the New York Governor's Office since they were the agency running the buyout program, but they eventually directly refused my interview request. A copy of the refusal letter is included in the Appendix I. I made three requests to speak to someone within ProSource Technologies, but they declined to participate, noting confidentiality concerns. The Small Business Administration (SBA) eventually agreed to talk to me, but refused to participate in a formal interview because they questioned the value of their information, which proved to be quite important when understanding the options households had following Hurricane Sandy. FEMA repeatedly redirected me to HUD. Community Board Three, the community board that represents Oakwood Beach for the local government on Staten Island, also refused to participate, suggesting that all buyout inquiries went to the Governor's Office.

Instruments and tactics.

I constructed two interview schedules based on the propositions that the literature offered. The interview guide for households included general questions about their life pre-Hurricane Sandy, longevity and roots in the local area (Oliver-Smith 1991), stress associated with the hurricane (Cernea 1997), risk perception (Fraser *et al.* 2003), and motivations and hindrances to move (Badri *et al.* 2006;

Cernea 1997). Interviews with individuals involved in policy development/implementation covered many of the same concerns but focus more on the decision-making process at a community level, how they conceptualize risk for their community, and communication with their constituents.

With the permission of the interviewee, I recorded all face-to-face interviews on two digital recorders (to try to avoid technological or logistical issues), digitally recorded telephone interviews, and subsequently fully transcribed the interviews for analysis. I also secured permission to re-contact the interviewee with follow-up questions or clarifications. I conducted all interviews in compliance with Institutional Review Board (IRB) standards, the IRB protocol approved on April 1, 2014, and amendments included in the appendix, and the agreement outlined in the attached informed consent form.

There is no magical number of interviews to reach theoretical saturation (Baker and Edwards 2012). As stated eloquently by the National Centre for Research Methods (2012), “it depends.” The amount of interviews required to answer any question is dependent on the nature of the question itself, where the research leads, access, and the resources the researcher has available. Based on conversations with my committee, I halted interviewing in Sea Bright at fourteen and in Oakwood at three, while leaving open the possibility of interviewing Oakwood Beach residents if any contacted me (Nigg 2013). I left open the possibility, however, that findings during the analysis phase would prompt me to conduct more interviews to explore unanticipated themes or questions in the data.

Analysis plan.

Expected data.

The main qualitative data sources I analyzed included verbatim-transcribed interviews and supplemental field and interview notes. The verbatim transcripts include not only spoken words but will capture abbreviations, laughs, interruptions, indicators of any extended pauses or silence, and other non-verbal sounds during the interview as well as notes on any detected body language (for face-to-face interviews). I utilized conventional content analysis methods on the interview transcripts to attempt to understand the data they contain, interviewees' motivations and decision making, and how this relates to the literature. The summary of policy documents informs the discussion regarding the legal and political setting within which households are making household residential decisions.

Content analysis.

When viewing the data in the verbatim transcripts, I used content analysis methods to look for sociological themes, focusing on the underlying behaviors, actions, and thoughts contained within the data. As defined by Hsieh and Shannon (2005), content analysis is "a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns." While there are multiple forms of content analysis, a directed content analysis is most appropriate for my study. Hsieh and Shannon suggest using this method as a tool to validate or extend concepts found in a literature review. Coding, when using a directed content analysis, allows the researcher to develop

initial codes based on concepts identified in previous studies and allows the data to suggest new or emerging concepts that the researcher must produce new codes to accommodate.

This method is appropriate for this study due to the literature review detailed in Chapter Two and the concepts identified and detailed in the development of the questionnaire. The interview schedule, as recommended by this method, employs open-ended questions intended to solicit information in predefined categories, but the open nature of the questions allows interviewees space to respond in surprising ways. Hsieh and Shannon suggest that a strength of directed content analysis is that researchers can use it by displaying codes or exemplars as positive or negative evidence for developing concepts. The main limitation to this method is that, by utilizing the literature to define themes, the researcher may bias themselves to find more confirmatory evidence of existing theory than they would have if they had used and conventional content analysis (Hsieh and Shannon 2005).

Process.

I used two primary tools when analyzing interview transcripts: coding and memoing. Lofland *et al.* (2005) defines coding as “the process of sorting your data into various categories that organize it and render it meaningful from the vantage point of one or more frameworks or sets of ideas.” Codes, then, are marked pieces of text that the researcher later retrieves for meta-analysis. Since I have three different sets of qualitative data to code (pre-event/post-event functioning questions from the

questionnaire, open-ended questions from the questionnaire, and interviews), I employed multiple coding schemes.

When examining the pre-event/post-event functioning questions from the questionnaire, I used descriptive coding as my first-cycle coding method. Descriptive coding encapsulates the topic of a piece of qualitative data in a word or phrase (Saldana 2012:88). To collapse these codes into meaningful categories, I used focused coding as my second-cycle coding method. This coding scheme allowed me to look for salient categories or patterns in what respondents indicate they liked most and least both before and after Hurricane Sandy (Saldana 2012:213).

Conducting analysis on the open-ended questions was a less straightforward because of both what I asked and the answers provided, both anticipated and unanticipated. I asked respondents to tell me both the steps in the process of recovery and any problems and pitfalls they encountered. While some respondents literally listed the steps in the process, others did not. Many respondents listed not only what happened but also how it made them feel, descriptors of the process (such as “nightmare” or “hassle”), negative psychological effects of the process (often depression), and some skipped listing the steps and simply listed their positive or negative experiences in the process, even on the first question. Some respondents even skipped one of the two questions, not noting the nuanced differences in what I asked. For this reason, I used eclectic coding for my first-cycle coding method.

Eclectic coding allows a coder to use multiple first-cycle coding methods simultaneously on one data source. The intention is that the researcher will further

collapse the data in second-cycle coding, using insights gained from first-cycle coding methods to develop categories (Saldana 2012:193). I simultaneously used descriptive (described above) and process coding methods on these two questions. Process coding relies on labeling actions undertaken by respondents. Since I asked the respondents to list the steps in the housing recovery process, this type of coding will give me insights on the stages or phases of this process (Saldana 2012:98). While it might make sense to use process coding on the process question and descriptive coding on the problems and pitfalls question, respondents often listed important emotional reactions to the process that process coding would not adequately capture. For second-cycle coding, I am using the aforementioned focused coding method since it allows me to collapse responses into meaningful categories and explore overall patterns in responses.

When exploring the open-ended questions from the interviews, I began with a set of pre-defined codes (also known as deductive codes), but also coded statements that emerge as trends or that related to my propositions and motivations (also known as inductive codes). Table 8 contains my deductive codes. To generate inductive codes, first I highlighted data that did not match deductive codes. Then, I created codes for highlighted data on my third read-through of the data. Creating codes at the end of a round of coding, instead of as I read the data or during deductive coding, increased the trustworthiness of the coding process because it reduced the biasing of emerging codes, and allowed me to create codes when looking at the totality of the data instead of piecemeal (Hsieh and Shannon 2005).

As anyone that has coded data knows, however, data are rarely as neat as textbooks recommend. Often, interviewees did not tell their story in this sequence, and I had to dig through the document and reorder codes to understand the progression of events.

After completing my causation coding, I moved to second-cycle coding, using pattern coding. Second-cycle coding lumps and splits codes into clusters based on emerging concepts. At this point, the codes are more based on developing concepts (analytical, based on constructed sociological concepts) than the causation codes used in initial coding. Specifically, I used pattern coding as my second-cycle coding scheme. Pattern coding lumps codes based on similarities into “meta-codes” to identify emerging themes in the data (Saldana 2012:210). By lumping together similar codes, the researcher can see networks or interrelations between groups of codes and can use this to make statements about larger themes in the data. Noting that it is impossible to know exactly how many codes will be necessary, Hsieh and Shannon (2005) suggest using 10 to 15 clusters to keep it broad. While I used memos to justify code selection in first-cycle coding, it was especially important in this phase to clarify my inclusion and exclusion criteria for lumping and splitting codes since this lead directly to concept development.

Where codes are concrete, tangible pieces of text, memos are a researcher’s notes to himself or herself that are more analytical in nature and assist with both the analysis and the discussion of results. I used memos for a few purposes; to clarify why I chose codes for sections of text and inclusion and exclusion criteria for codes, to note any procedural or methodological issues I encountered during the analysis process,

and to keep track of my own running, preliminary development of concepts or theories throughout the analysis process and areas for potential future work (Lofland *et al.* 2005). I dated and time stamped all my memos to keep a record of the progression of my thought processes.

When approaching this analysis, I began by organizing the data, at first chronologically then later by theme (etic) as they develop. As suggested by Saldana (2012:18), I read my transcripts while listening to the recordings at least once without coding and wrote in analytic memos and ideas for codes. I followed by starting to open code the data by hand, reading the transcripts and marking trends or text that appears to be related to motivations. Due to my limited experience with coding software, I coded a selection of transcripts by hand initially (using highlighters and notes in whitespace) and later migrated my initial codes into ATLAS.ti. This allowed me to become more familiar with the coding process and the software at separate times.

It is important to acknowledge two characteristics of the process described above. The analysis process occurred simultaneously with the data collection process. Findings from my initial interviews shaped and refined my data collection in subsequent interviews. For example, after my second interview I realized that a couple of questions were not soliciting the data I had intended, and altered their delivery for subsequent interviews. While analysis is described as a linear process, the process more closely resembles a loop. I reanalyzed all of the transcripts anytime the data lead me to shift my coding scheme, caused me consider a new explanations, and at the end

of the data collection process. At the conclusion of data collection, I returned to the original, first data collection activities and look for themes that run throughout and updated my coding scheme using the same, most up-to-date version of codes (using the evolving codebook as a reference).

Methods to ensure qualitative data quality.

I used multiple techniques to overcome the inherent shortcomings of this method and to ensure the credibility, authenticity, and transparency of my analysis. By using quantitative questionnaire data, I triangulated my data sources to ensure that I have justification for themes I developed. I also checked a selection of transcripts for accuracy. To keep my coding authentic, I constantly checked code definitions and ensured that my code definitions were not drifting as I progressed through the process. Since I am relatively new to coding, I relied on experienced coders to check a portion of my codes and developing concepts to ensure they were both believable and authentic. I used pattern matching to explore how patterns in my codes correlated (or, in some cases, did not correlate) to previous findings (presented as propositions in the literature review). I also scanned the documents for alternative explanations, or data that challenged my understanding of the phenomenon, based upon either the propositions or preliminary findings.

I undertook a number of steps to help immerse myself in the data. First, I spent time in both of my case study settings to develop an understanding of the environment in which people are making these decisions I am exploring. Second, while on these exploratory trips, I had informal conversations with residents to expand my

understanding of their experiences, gain entree into the setting, and check the validity of initial ideas. Third, I transcribed a portion of my own interviews to gain an understanding of the data. Lastly, I also gave extra focus to presenting any “negative” or disconfirming information I found that challenged my understanding.

Case Studies

When choosing case study sites, I selected communities that, according to media reports and other ongoing academic studies, appeared to be quite similar in respect to hazard exposure but were approaching housing recovery from Sandy in antithetic ways. Specifically, I chose Oakwood Beach, NY and Sea Bright, NJ. Prime Hook, Delaware serves as the site of my pilot interviews because it is a local, coastal community with similar hazard exposure as both Sea Bright and Oakwood Beach. The following sections detail my case study sites, exploring their historical development, geography and demographics, hazard experience and exposure, and the impacts of Hurricane Sandy.

Prime Hook.

To test my interview schedule, I conducted pilot interviews in Prime Hook, Delaware on January 17, 2014. I chose this site due to similarities in setting to the case study sites, previous hurricane experience, damage due to Sandy, and access issues residents frequently experience. This trip served as a good test of the validity of the interview schedule, as a chance to gain interviewing experience in a similar setting, and as an opportunity to time the interviews. During my time in Prime Hook, I completed three in-depth interviews.

Prime Hook is a small coastal community in Sussex County, Delaware. This is a barrier island running northeast to southwest, with a marsh separating the island from the mainland. One log-floated public road connects the island to the mainland. This road is almost at sea level: only approximately one foot of elevation and five feet of rocks bordering the road separate the road from the water. There are no businesses or municipal services on the island: it is entirely residential.

Based on the housing type and size, the island could be easily split into two distinct regions. Many of the houses on the southern portion of the island were two to four story and approximately 3,000-4,000 square feet. Many of the homes were elevated on stilts, had large columns on the front, and showed no signs of disrepair. Homes on the northern portion of the island are one to two floor homes that are smaller than those on the northern portion are. Many of these homes appeared to be older beach shanties that residents transformed into four-season homes. There was a second divide between the oceanfront and marshfront homes. On the ocean-side, many of the homes were quite a bit larger (approximately 1000 feet larger on average) and appeared to be newer construction. I saw little evidence of hurricane damage across the island. A few homes on the marshland side showed signs of water damage, and a couple of homes on the ocean side had construction underway (which may or may not be due to hurricane damage).

I spoke to two residents that lived on the bayside of the island and one that had oceanfront property. All of the interviewees lived in Prime Hook full time, were white males, and approximately sixty years old. I caught two interviewees outside their

homes, and I obtained the final interviewee via snowball sampling. While I would have ideally wanted more variation, the time of year and time of day I visited limited my potential interviewee pool. Acknowledging the homogeneity of my interviewees, they still each offered a different perspective that helped orient my interview guide. Further, as stated earlier, the purpose was to test the interview guide with residents of a coastal community with hurricane experience. While none of the interviewees sustained substantial damage due to Hurricane Sandy, all three recalled the 1992 Nor'easter and indicated that the island suffered heavy damages from that storm, which led to substantial mitigation efforts across the island.

Based on these preliminary interviews, I made the following changes. Since I found them at their homes, none of the residents moved out of the community following Hurricane Sandy. Many of the interviewees, however, stumbled when asked to imagine a scenario where they would move. Based on this experience, I altered the wording and my delivery of this question to make its intention clearer. In addition, all three of the interviewees avoided providing me with their own opinion, and tried to give me a general opinion of the community instead. To avoid this in future interviews I probed interviewees, asking, "I understand that the community thinks X, but what do you think?" One interviewee was also hesitant to examine his own reasons for not moving. To avoid this, I added a lead-in statement to soften this question, noting that residents have to difficult decisions and have many options following an event like Hurricane Sandy.

Oakwood Beach, NY.

General history.

In 1670, the second Governor of the New York colony, Francis Lovelace, purchased Staten Island from Native Americans (Lundrigan 2004:20). Shortly after that, Governor Lovelace gave the area now called Oakwood to Jacques Guyon. During this time, the area was primarily farmland, and remained farmland until 1860 when the Toonerville Trolley (later replaced by the Staten Island Rapid Transit) was built, allowing the area to become a popular vacation destination (Gutis 1986). The neighborhood of Oakwood was founded shortly thereafter in 1890. In 1896, the Oakwood Park Hotel was built, giving tourists a place to stay locally. Many of the homes in the area today were constructed in the early 20th century as beach homes, but, especially during the Great Depression, many of the homes were later converted to year-round residences (Gregory 2013; SINY 2014).

Tourism dropped in the mid-1950s as tourists (that were mainly from the general New York area) began to travel further away (to places like Sea Bright) for vacation. The sewage plant to the southeast of Oakwood was constructed in 1950. Up until the 1960s, Staten Island was primarily vacation homes built to lower construction standards and small family farms (New York Rising 2013). A second economic boom to the area came in 1964 with the completion of the Verrazano-Narrows Bridge, which allowed working-class families from other parts of New York City to move to the island (Barr 2013). This was a chance to own land and a home, which was unavailable to them on Long Island or other parts of the city. This sudden rush of new residents

also increased land value and population density, leading to a second round where many vacation homes were converted to all-seasons homes. Rapid development from the 1960s to the 1990s also had the secondary effect of removing a portion of the wetlands and much of the marsh that offered natural mitigation against storm surges (Knafo and Shapiro 2012).

Geographic setting.

Oakwood is a coastal community in the Staten Island Borough of New York City. Figure 4 shows the location of Oakwood Beach within Staten Island Borough.

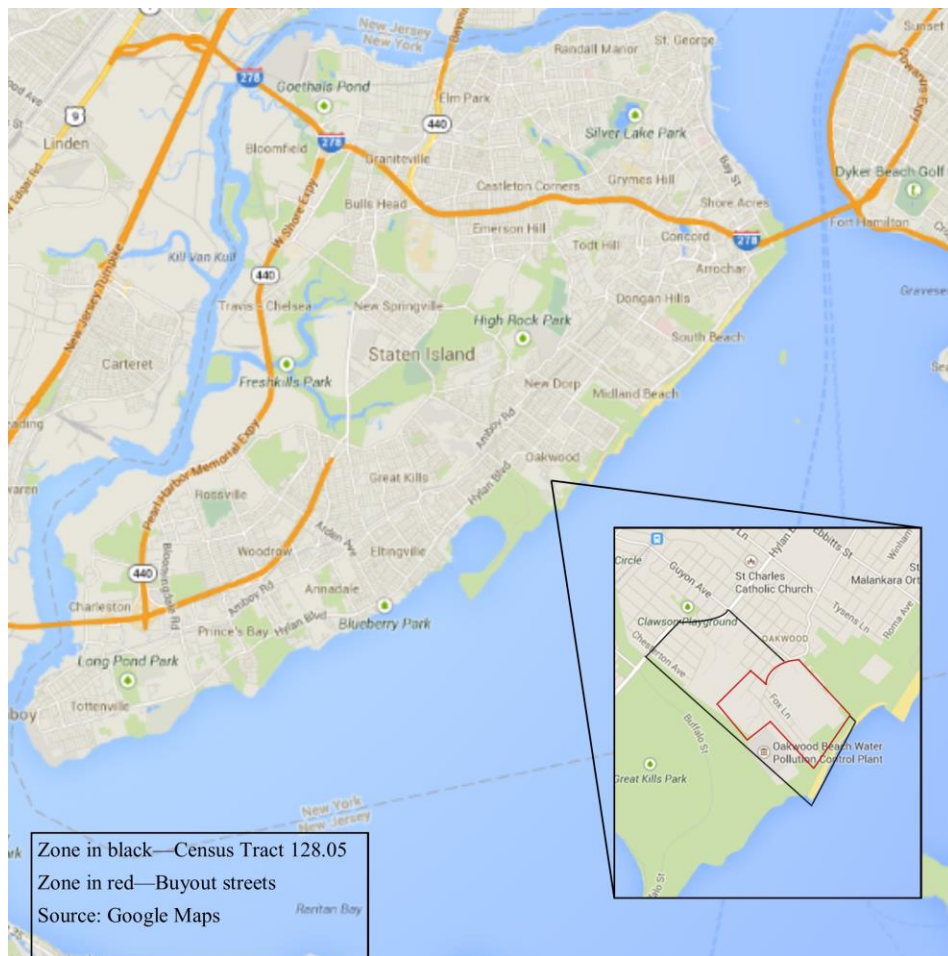
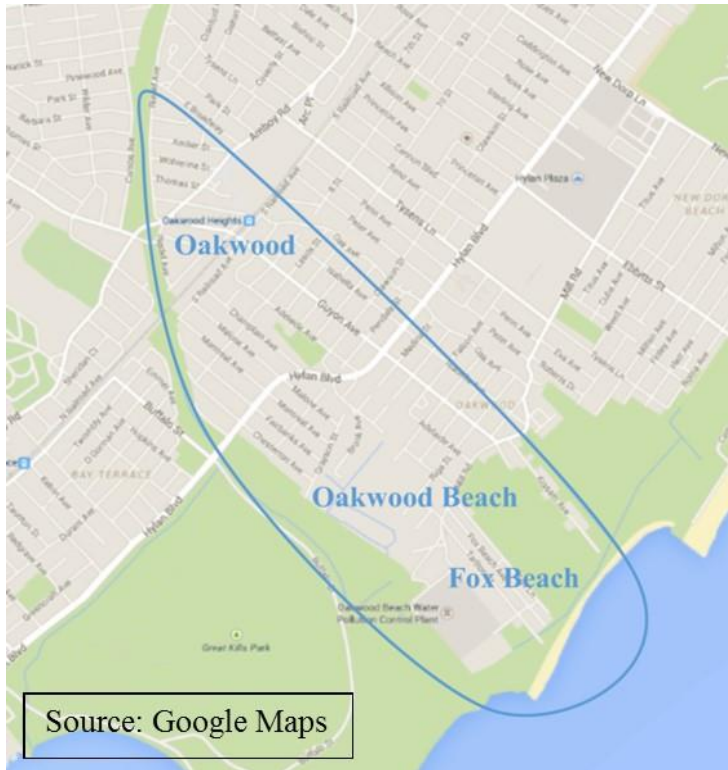


Figure 4: Staten Island, Oakwood Beach, Census Tract 128.05, and the Buyout Zone

The area is broken up into three sections: Oakwood Heights to the west of Hylan Boulevard, Oakwood Beach to the east of the boulevard, and Fox Beach to the southeast of Oakwood Beach. Figure 5 visually displays these three areas. Due to the buyout and coastal damage, this study focuses on Oakwood Beach. Hylan Boulevard to the Northwest binds Oakwood Beach, Great Kills Park borders to the Southwest, Tyzen Lane to the Northeast, and the Atlantic Ocean to the Southeast. Oakwood Beach is approximately 1.025 square miles and averages five feet above sea level. The community of converted beach bungalows sits between a marsh with 12-foot tall reeds and a sewage treatment facility. These homes are primarily one to two story, single-family dwellings, with approximately 6 feet separating one house from the next. There are some concentrated areas further north with sections of condominiums. Closer to the shore there are larger, newer, more traditional beachfront homes. Aside from the sewage treatment plant and Grace Bible Church, the area is entirely residential.

Figure 5: Three Parts of Oakwood, Staten Island



Demographics.

According to the 2010 Census, 3,158 live in Census Tract 128.05, which serves as the closest estimation for the study area in Oakwood Beach. The average household size is over three people (3.08 per household), and 38% of the households contain individuals under the age of 18. There are 1,154 housing units in the census tract, with a 90% occupancy rate. While this is higher than Sea Bright, it is lower than the state average of 94% occupancy. Of the occupied units, 76% are owner-occupied,

which is considerably higher than Sea Bright (55%) or the state (53%). The vacancy rate is 5%, compared to 10% for the state. Only 11% of the population is 65 and over. 92% identify as white, and 91% identify as non-Hispanic or Latino. The median household income is \$87,303, while the mean is \$110,448, suggesting that a portion of outliers is pulling up the mean income. These are both significantly higher than the state averages (\$57,683 median and \$83,578 mean). Only 27% of residents have a Bachelor's Degree or higher, which is 6% lower than the state.

Disaster history.

Oakwood Beach primarily suffers from wildfires and flooding. A large swath of high grass surrounds Oakwood Beach, catching fire often in unusually dry spells. In 2009, a major fire burned down 40 acres of wetlands and threatened many of the homes in the community. The December Nor'easter of 1992 that also affected Sea Bright brought more than three feet of storm surge, flooding many homes in Oakwood Beach (81 mph winds) (Knafo and Shapiro 2012). This storm also destroyed pieces of a berm built in 1950s to protect Oakwood Beach from storm surge. Two storms, one in 1994 and another in 1996 also caused flooding damage and coastal erosion. Leading up to Sandy, an unnamed nor'easter in 2010, and both Tropical Storm Lee and Hurricane Irene in 2011 all caused flooding and power outages in the area, primarily affecting basements.

While the berm was repaired following the breach in 1992, plans by ACE to build a 15-foot high levee to wrap around Oakwood Beach never came to fruition, and ACE subsequently ran out of funding for the project (Knafo and Shapiro 2012). In

2000, ACE completed the Oakwood Beach Coastal Storm Risk Reduction Project, which consisted of a levee and tidal gate, built to the level of a 15-year-storm, and a second project that consisted of raising roads to protect Oakwood Beach from Oakwood Creek (ACE 2013). Both of these mitigative efforts suffered major damage during Hurricane Sandy.

Hurricane Sandy.

Impacts.

Hurricane Sandy made landfall approximately 120 miles south of Oakwood, resulting in 23 deaths on Staten Island (Barr 2013). According to HUD (2014b), Hurricane Sandy damaged 909 structures, flooding 152 structures with one to four feet of water and an additional 228 with over four feet of water in Oakwood. Of those damaged, 733 owned their homes and 176 rented. Approximately 57% of the homeowners in that area carried a homeowner's insurance policy. Many of those impacted were permanent residents; the storm damaged 79% of the non-seasonal housing stock. According to ACE (2013), Sandy was a 300-year storm for Oakwood Beach. Noted as one of the most heavily impacted neighborhoods in New York, many media outlets called Oakwood the "Ground Zero" of Hurricane Sandy damage (Knafo and Shapiro 2012; New York Rising 2013). Most of Oakwood Beach encountered 13 to 15 feet high storm surge, with the worst of the flooding contained below Hylan Boulevard but nearly reaching the Staten Island Rapid Transit Line. On Kissam Avenue storm surge ripped 13 of the 17 homes off their foundation. Storm waters

inundated the Oakwood Beach Wastewater Treatment Plant, resulting in the discharge of 237.5 million gallons of mostly treated sewage (Kenward, Yawitz, and Raja 2013).

Buyouts.

As a part of the recovery effort, HUD provided \$1.71 billion for New York State through Community Development Block Grant Disaster Recover (CDBG-DR) Program on April 26, 2013. The state created the State of New York Action Plan for Community Development Block Grant Program – Disaster Recovery (Action Plan) in response to repeat losses resulting from Tropical Storm Lee, Hurricane Irene, and Hurricane Sandy (Cuomo and Towns 2013). The state set aside \$400 million of this money to assist with buying high-risk properties, categorized by FEMA as Special Flood Hazard Areas (SFHA), as an effort to prevent future losses (Ferris, Petz, and Stark 2013). SFHA properties include houses that are in the highest-risk areas (called the V-Zones on flood maps) with greater than 50% of the value of the structure damaged (State of New York 2014).

If they agree to participate, the homeowners receive full, pre-storm value for their home and may be eligible for a number of incentives, discussed further in the policy chapter. The prospect of buying property in Oakwood is appealing to the State for a few reasons. This allows the State to expand the Staten Island Bluebelt, a natural drainage corridor and opens up green space for the community and wildlife to enjoy (New York City 2014). This drainage corridor acts as a natural marshland that reduces flooding risk for the surrounding area (New York Rising 2013).

Sea Bright, NJ.

General history.

The history of Sea Bright begins with Eliakim Wardell, a Quaker from Newbury, Massachusetts, when he traded with Native Americans in 1668 for the land that became Sea Bright and Monmouth Beach. This land remained undeveloped and generally undocumented until the mid-1800s (Monmouth County 2005). Historical accounts trace the settlement of Sea Bright back to the early 1840s. People living in the area at that time called the settlement “Nauvoo”. There are two proposed origins of this name. One theory states that the name came from Joseph Smith, the Mormon leader who visited the area in 1839, because Smith also named a town in Illinois Nauvoo. Translated from Sephardic Hebrew, the name means “beautiful or pleasant place” (Sea Bright 2014a). The alternative theory explains that Nauvoo originates from Native Americans living in the area at the time of its settlement, which translates to “Bright Sea” (Monmouth County 2005).

Initially, the town was a few shacks on the barrier spit, with residents that primarily relied on subsistence fishing. Accommodations started to develop that slowly (and later, more rapidly) redefined the character of this community. In 1842, Henry Wardell, Eliakim Wardell’s great grandson, built the Ocean House Hotel, with capacity for approximately 300 guests. Sea Bright became a major hub for fishing, as Swedish anglers began to use Sea Bright as a base for their expeditions (Sea Bright 2014a). Transportation options from other major metropolitan centers, such as New York, were limited to steamboat at that time. This changed in 1865 when the first

railroad line, the Long Branch and Seashore Railroad line, was completed, providing a more convenient and accessible mass transit option. The site began developing more rapidly into a tourism site, with seven major waterfront hotels, each holding 200-400 guests, opening in the 1880s (Moskowitz 1989). Urbanization in the late 1900s (which residents subsequently abandoned due to storm damage) resulted in the flattening of the natural dune system on the peninsula, which served as a natural barrier to storm surge and flooding, to create lawns and gardens (Ashman *et al.* 2013). Even when the rail line was removed in the early 1920s due to repeat storm damage, the town, like many oceanfront towns in New Jersey at that time, continued to rely on its hotels and tourism to drive the economy into the 1940s (Moskowitz 1989). The construction of the Garden State Parkway in 1947 reduced the travel time from New York City to approximately an hour, effectively reinvigorated tourism in the area. This development made Sea Bright increasing accessible for tourism and made the site more appealing for a seasonal home.

Geographic setting.

Geographically, Sea Bright is a barrier spit, constrained by the Shrewsbury River on west, the Atlantic Ocean on the east, Sandy Hook to the north, and Monmouth Beach to the south. The area is small, with an average width of less than half a mile, a total of four miles in length, approximately 0.64 square miles of land, and averages only four feet above sea level (Sea Bright 2014a). A sea wall, constructed of rocks and concrete averaging 12 feet high was built in 1947 for \$703,000 (funded by the state, county, and town) on the abandoned Long Branch and

Seashore Railroad line. This wall separates the town from the beach and the ocean, and parallels Ocean Avenue (Route 36), the main thoroughfare through the town. The sea wall breaks in the downtown area and provides public access to the beach. Private staircases blanket the sea wall and provide residents access to the beach. The city owns 30-35% of the beach and uses it for marinas and public access. The remaining 65-70% of the beach is private, and owned by individuals (McCay *et al.* 2005). Public beach access costs eight dollars per day, or \$100 per season, and the city provides parking spaces for approximately 300 cars. Figure 6 shows the location of Sea Bright within the state of New Jersey.

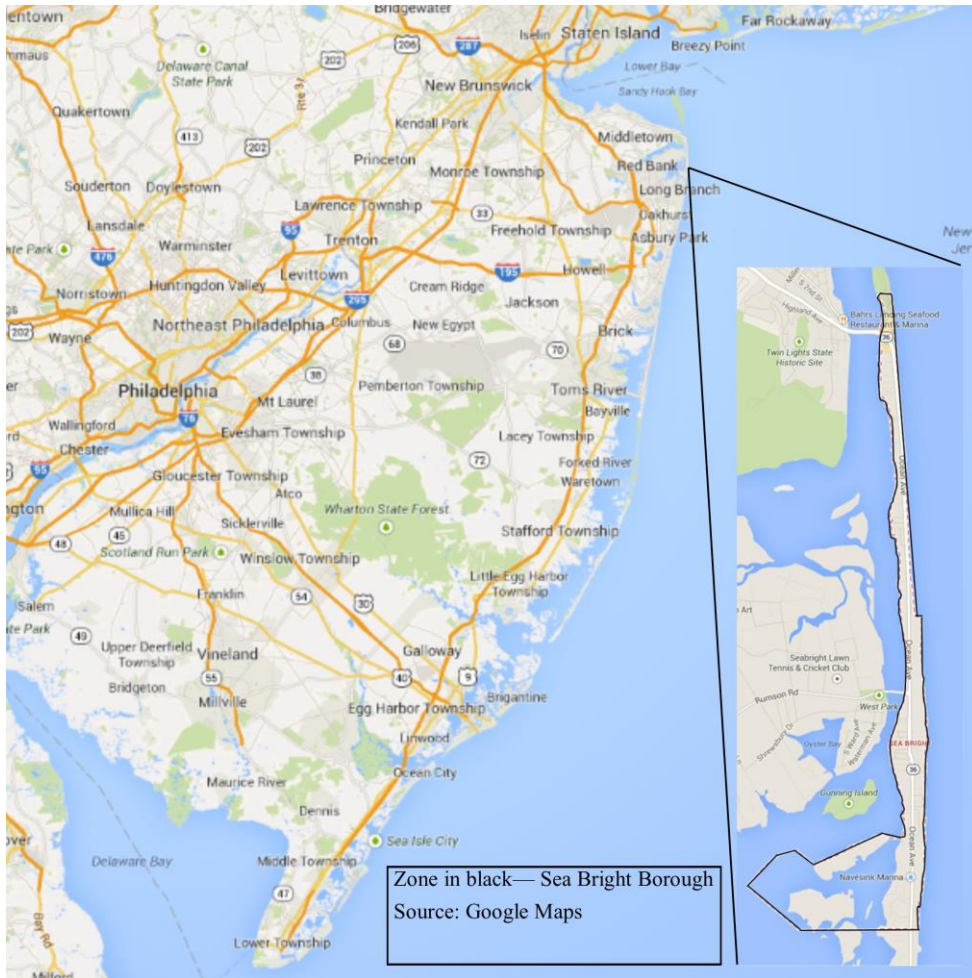


Figure 6: Map of Sea Bright, New Jersey

A majority of the land on the peninsula is developed on the west side of Ocean Avenue, and ordinances in place before Hurricane Sandy did not allow residential construction over 38 feet high, limiting houses to three stories or less (Sea Bright 2014b). The southern end of the island begins as detached single-family homes and blends to multi-family condominiums as you travel north along Ocean Avenue. The downtown is a mix of densely populated urban housing on the western side of Ocean

Avenue, with a fusion of businesses and municipal buildings on the eastern side of the road. The northern end of the island is primarily detached single-family homes.

Within the town, the main industry is tourism, which drives the restaurant and beach club businesses. This is a “bedroom community”, with only approximately 30 residents of Sea Bright working in town and approximately 450 traveling into Sea Bright for work, while the other working residents commute (typically more than 15 minutes) outside of the town for work. The largest employer, (providing roughly 50% of the jobs on the peninsula) is from the food service sector, owing to the lack of a major industrial presence on the island and the reliance on tourism. Property tax revenue accounts for approximately 80% of the municipal budget. A majority of those funds go to obligatory costs such as a police force and funding local schools (since there are none on the island) (Ashman *et al.* 2013).

Demographics.

Sea Bright is a quite different place from the rest of the state of New Jersey demographically. According to the 2010 Census, 1,412 people live in Sea Bright. This is a drop from 1,818 in 2000, but is consistent with similar towns along the New Jersey coast, as many residents are keeping their coastal residences as seasonal homes and moving to more inland primary homes. There are 1,211 housing units, with an occupancy rate of 65% (792 units). While 35% of the units were vacant, only 3% were for sale. Approximately 20-25% of residents are seasonal. Of the occupied units, 55% are owner-occupied, and 45% are renter-occupied. Only 15% of the residents are 65 years old or older. Perhaps due to the lack of schools on the spit, only 11% of the

residents are under the age of 18, and the average household size is considerably smaller than the rest of the state (1.82 for Sea Bright compared to 2.7 for the state). Sea Bright is not a racially diverse setting: 95% of the residents identify as White, and 94% identify ethnically as non-Hispanic or Latino. To put these numbers into perspective, in the state 23% of the residents are under the age of 18, only 69% of the residents identify as White, and 82% identify ethnically as non-Hispanic or Latino.

The mean household income (\$130,449) is higher than the median income (\$78,688), suggesting that income is not evenly distributed and some portion of households with high household income skew the mean income substantially. Interestingly, the median income is lower than that of Monmouth county (\$84,746) while Sea Bright's mean income is higher than the county mean (\$113,330), further reinforcing the income disparity in Sea Bright. Both the mean income and median income are higher than the state averages (\$96,602 and \$71,637 respectively), suggesting the area is more affluent than the typical town in the state. This is a well-educated population, with over half the residents (52.4%) having at least a bachelor's degree (compared to 35% for the state of New Jersey).

Disaster history.

The discussion that follows summarizes the disaster experience of Sea Bright. A series of four storms from 1880-1890 washed part of the Octagon Hotel out to sea, destroyed a makeshift rock wall the residents constructed, and pushed construction off the coast (Monmouth Plus 2001). A fire in 1891 destroyed the entire downtown business district and displaced approximately 150 families (Anon 1891). As

mentioned earlier, the Long Branch and Seashore Railroad line was removed in the 1920s because floods washed out the line completely more than four times before its removal. Storms in 1935 and 1943 prompted the building of the Sea Wall in 1947 (Ferreira *et al.* 2012). In 1992, a nor'easter caused major damage in Sea Bright, reshaping the coastline, breaking the sea wall in two spots, and prompted the town to reconsider their mitigation strategy.

In 1994, ACE began the largest beach fill in their history in Sea Bright, using local, state, and federal funds (Ferreira *et al.* 2012). To strengthen the dune system on the spit, residents began planting dune grass in 1997 on both the northern and southern portion of the peninsula, and that practice continues in 2014. ACE completed two subsequent rounds of beach replenishment on Sea Bright, completing one round in 2001 and the second in 2013.

Two other notable storms affected Sea Bright leading up to Sandy. The remnants of Hurricane Ida hit Sea Bright in 2009, bringing only 45 mph winds but causing significant erosion along the coastline and greatly depleting the dunes (New Jersey 2014b; Reynolds 2009). Hurricane Irene affected the area on August 28, 2011, as a category one storm, bringing three to five foot of storm surge, ten inches of rain, and causing another round of extensive coastal erosion.

Hurricane Sandy.

Hurricane Sandy made landfall approximately 87 miles South of Sea Bright, bringing with it a 13 feet high storm surge and 100 mph winds to the town. The storm inflicted a tremendous amount of damage to the area, with storm-related damage

estimates reaching approximately \$391 million dollars (Spahr 2012). According to HUD (2014b) Hurricane Sandy damaged 720 structures, flooding 376 structures with one to four feet of water and an additional 215 with over four feet of water in Sea Bright. Of the homes damaged, 360 were owner-occupied and 360 were rental properties. Of those that owned their homes, 25% did not have homeowners insurance. Many of those affected were permanent residents; the storm damaged 76% of the non-seasonal housing stock. This loss resulted in a 13.4% drop in property values, which, as noted earlier, results in a significant loss to the largest taxable contributor to city operating funds (Ashman *et al.* 2013). Six feet of sand and debris piled on to Ocean Avenue in the wake of the Hurricane. The storm lifted Driftwood Beach Club, built on the seaward side of the wall and assessed at \$10.8 million prior to Sandy, off its foundation, and totaled the building (Spoto and Renshaw 2013). All of the businesses temporarily shut down following the storm, and three quarters of the homes were uninhabitable (Brady 2013).

Chapter 4

POLICY REVIEW

Laws are like sausages. It's better not to see them being made.
- Otto von Bismarck

To understand the context within which households are making residential decisions, it is critical to understand the policies and programs that influence and bound their decisions. To that end, this policy review examines major federal, state, and local policies and programs that guide household recovery after major coastal flooding in New York and New Jersey. Noting that policy is not only written documents but also government action or inaction on an issue, this review pays special attention to programs in place to assist disaster victims with issues relating to housing. This policy review begins by outlining the roles and responsibilities of the local, state, and federal government in housing recovery, detailing the major federal stakeholders involved in the process. The review then summarizes major federal frameworks, strategies, policies and programs that guide housing recovery. At the state and local level, I focus on recovery and mitigation plans, as well as policy statements that clarify how the state plans to utilize federal funds authorized by the policies above. This review concludes with a discussion of the implementation of these frameworks,

strategies, policies, and programs in response to Hurricane Sandy in New York and New Jersey.

Housing Recovery Policy

Reflecting findings of researchers, FEMA notes that community recovery is not orderly and rigid. Rather, it is a site-specific, dynamic process driven by local demands, capacities, and capabilities (FEMA 2011a; Johnson 1999; Rubin, Saperstein, and Barbee 1985). As a dimension of recovery, housing recovery is not an exception. When compared to the response phase of disaster management, the policies and programs that guide and support the recovery phase are more collaborative, adaptive, and situation-specific. A few unique aspects of recovery necessitate this flexible approach. First, while recovery does not operate on a schedule with a set end date, aid and support is often limited to a set time window of availability (FEMA 2009; Haas, Kates and Bowden 1977; Phillips 2009; Rubin, Saperstein and Barbee 1985). Second, damage to the infrastructure affects the recovery time, and researchers found that as damage increases, so does the necessary time for recovery (Eadie 2011; Haas, Kates and Bowden 1977; Mader *et al.* 1980). Lastly, local needs in recovery are unique and evolve. Every situation brings its own location-specific demands, stakeholders, capacities, and capabilities. For all of these reasons, FEMA (2011a) suggests, “recovery processes should be scalable and based on demonstrated recovery needs.”

Policy, by nature, is a tool used by government to influence behavior (Schneider and Ingram 1997; Stone 2002). In the case of housing recovery, government wants to incentivize either returning to an area or moving to a new

location. Due to the Takings Clause in the Fifth Amendment, disaster relocation is a voluntary process; the government cannot legally force participation in a home buyout program (Lewis 2012). Whether planned or not, housing recovery policy reflects this inherent necessity for scalability and flexibility of the recovery process. To persuade residents to participate in a program, government often incentivizes behavior they wish to promote. To complicate this further, there is no “Office of Post-Disaster Recovery Decision-Making”; many government offices and differing levels of government have some level of involvement or interest in where people live following a disaster, including FEMA, HUD, SBA, the U.S. Department of Agriculture (USDA), along with numerous state and local governments.

Similar to the stakeholders, a number of policies guide housing recovery activities that typically do not solely focus on disaster housing recovery. In many cases, housing recovery is only a section or an addendum to the policy. This results in policies with different policy goals and options, often available to the same impacted public. A number of policies, typically through authorizing assistance programs or incentives, encourage people to rebuild in situ. Other policies and programs, often available to the same individuals, enable and incentivize relocation. Since many of the funds provided to states for disaster recovery are discretionary, there are even cases where programs authorized by policy and operated by the state encourage rebuilding and incentivize relocation at the same time in different communities. Part of what complicates the policy in this area is that it is a newer policy domain. The policy option of relocation was largely ignored until the Great Floods of 1993, after which

FEMA started to purchase more “repeat losses” properties, totaling over 20,000 properties acquired by 2012 (FEMA 2012; Lewis 2012).

Researchers have not explored housing recovery policy as a larger policy domain at depth. The importance of this realm, however, cannot be understated. Hurricane Katrina in 2005 illuminated many policy issues associated with housing recovery. FEMA (2009) noted that many of the housing strategies used following past disasters are not suited for responding to the demands associated with catastrophic losses. The widespread damage caused by Hurricane Katrina resulted in extensive confusion regarding roles, responsibilities, and capabilities of federal, state, and local levels of government. As a result, FEMA assembled the National Disaster Housing Strategy (NDHS) in 2009. This document signaled a departure from a disjointed system by outlining the housing recovery process, explaining roles and responsibilities across levels of government and between key stakeholders within the federal government. The following section further explores the roles and responsibilities of different levels of government and different government offices in housing recovery. The mere creation of this document indicates the importance of clarifying and refining roles and responsibilities in housing recovery.

Roles and Responsibilities

Local government is responsible for the safety of its citizens (Burby 2006; FEMA 2009). They often work to ensure safety by developing disaster mitigation, response, and recovery plans, and are uniquely equipped to build and maintain these plans this is because they possess the most knowledge about local capabilities,

capacities, and hazard exposure (FEMA 2009). One of the most critical duties of local government, in respect to housing, is establishing and enforcing land-use patterns, zoning ordinances, and building codes. Pursuant to these responsibilities, local government informs the public, through laws and policies, where and how to build their homes so that they are protected from hazards. In the case of a disaster, the local government bears primary responsibility to prepare for and respond to disaster, as well as promoting recovery. Following a disaster, local government determines if an area is safe for re-habitation, and if not, where they should rebuild. If they do rebuild in situ, local governments can revise building codes to protect from a repeat event.

When the local government lacks the resources and capabilities to respond to or support local recovery, they can request state assistance. If a state's governor determines that a disaster event exceeds local ability to respond or recover, typically by reviewing preliminary damage assessments, they can declare a state of emergency.

In the case of a state of emergency, states provide support, where needed, for local government efforts (FEMA 2011a). Often the state provides financial resources and expertise to assist with the recovery effort, and can supply exemptions to state regulations to hasten the recovery effort (FEMA 2009). One of the more relevant state roles in housing recovery is to apply for and administer federal grants programs, such as CDBG-DR and the HMGP, which serve as major sources of aid in recovering from disasters. I discuss these programs in more detail later in the document.

When the state believes the response or recovery effort exceeds their capabilities, the state governor can appeal to the federal government for support. If

approved, the President, using authorities provided by the Stafford Act, can issue either an emergency or major disaster declaration, which allows the federal government to provide aid to individuals, communities, and other public agencies (McCarthy 2011). The types of federal support provided is a decision the federal government makes in counsel with the affected state and local government. Much like the relationship between state and local government, the federal government supports state and local efforts through funding and technical expertise. Congress can also provide special aid appropriations for additional funds in the case of a major disaster or catastrophe.

Government agencies are not the only entities involved in housing recovery. NGOs are involved in much of the demolition, cleanup, repair, and restoration of housing after a disaster. NGOs can also provide financial support for housing recovery, as well as advocacy for households to help them receive aid. The private sector often also provides volunteers and expertise in both demolition and reconstruction (FEMA 2011a). Since the government does not build housing, private sector involvement is critical for a successful housing recovery effort (FEMA 2009). For these reasons, FEMA (2011a) recommends that both NGOs and members of the private sector be involved in both pre- and post-disaster recovery planning. By involving these stakeholders, communities can better plan for and utilize the resources these parties bring to housing recovery and ensure that during reconstruction a common building code is employed, giving the opportunity to build back smarter. The

discussion below provides a brief description of the federal offices with a major role in housing recovery.

- FEMA: In an effort to merge disaster-related responsibilities from many different organizations under one agency, President Carter created FEMA in 1979 under Executive Order 12127. FEMA's mission is to "support our citizens and first responders to ensure that as a nation we work together to build, sustain and improve our capability to prepare for, protect against, respond to, recover from and mitigate all hazards" (FEMA 2013a). Pursuant to the Stafford Act, FEMA is the coordinating agency in response to natural disasters, and primarily interfaces with the state government to support and help coordinate disaster recovery. When focusing specifically on housing recovery, FEMA is the coordinating agency in sheltering assistance and partners with HUD for interim housing assistance (FEMA 2011a). FEMA is headquartered in Washington D.C. and has 10 regional offices across the United States.
- HUD: In 1934, Congress passed the National Housing Act, creating the Federal Housing Administration (FHA) with the goal of making home ownership an attainable goal for families. To further this work, Congress passed the U.S. Housing Act of 1937, creating the United States Housing Authority, which provided subsidies to local public housing agencies to assist low-income households and improve their quality of life. In 1965, these two agencies merged into one, under the Department of Housing and Urban

Development Act as part of President Johnson's Great Society program.

HUD's mission, owing to its two earlier counterparts, focuses on developing sustainable, inclusive communities while ensuring that housing is available and affordable (HUD 2014a). In disasters, HUD primarily assists with locating interim housing after a disaster, manages long-term housing recovery, and provides CDBG-DR funding (which I discuss in detail later in the document). HUD is also headquartered in Washington D.C. with numerous regional offices.

- **SBA:** Congress created the SBA in 1953 with the passage of the Small Business Act, creating an agency that was to “aid, counsel, assist and protect, insofar as is possible, the interests of small business concerns” (SBA 2014). The SBA provides federally subsidized loans to homeowners to bridge the costs of replacing their homes not covered by insurance. Homeowners can use these loans to refinance or rebuild their homes, or to replace lost property or improve the survivability of their home, through methods such as raising their homes.
- **USDA:** The USDA, through their Office of Rural Development, provides another source of disaster aid in the form of low interest loans to very low-income households for the repair of their homes. They also direct victims to available housing units the USDA currently finances.

While all of the stakeholders described above are critical in housing recovery, the decision to relocate and resettle or rebuild, ultimately, rests with citizens, and the local government. FEMA (2009) suggests that local government must decide if they want to resettle quickly, because households rebuild hastily, often in the same location, which undermines the efficacy of resettlement. The state and federal government cannot legally force a community to move following a disaster. They can, and often do, influence the decision by incentivizing behavior. In fact, they often encourage communities to build in contingencies for relocation and resettlement into disaster recovery planning efforts, especially if they live in repeat hazard zones like floodplains. This is because, as noted by Baker (as cited in Jacobson 2012), communities that plan for recovery prior to a disaster have a better chance rebuilding in a smarter way (whether that be in situ or in a new location) than communities that do not plan for recovery.

Policies and Programs

Floods result in more economic losses than any other natural hazard within the U.S. (Hayes and Neal 2011). Olshansky (as cited in Jacobson 2012) argues that floods cause more permanent change in communities than any other hazard. This change comes from the frequency of flooding in the U.S., the localized effects of flooding, and the wide variety of programs and aid available from the federal government after flooding events. Through policy, the federal government typically approaches post-disaster repetitive loss flooded properties with four different strategies, often simultaneously: changes in land-use management, buyouts, encouraging homeowners

to rebuild better through flood insurance incentives and building codes, and by providing aid for structural mitigation (FEMA 2009).

When deciding how to recover the housing stock after a disaster, stakeholders have a number of policies and programs available to them. Multiple types of policy are at play, including strategies and frameworks that define roles and responsibilities, policies that create and reinforce markets to meet needs of victims that the private sector does not naturally meet, and distributive policies that offer aid for housing recovery. While there are some inherent problems in defining policy typologies, Birkland (2011:209) argues that identifying policy types is important because “typologies are useful in understanding how and why some policies are made the way they are, and why some groups do better than others in policy debates and actual enactment”. The following section explores the policies that affect housing recovery, categorized by the type of policy. Table 9 visually displays the policies covered in the following section.

Table 9: Policies Guiding U.S. Housing Recovery

Policy	Type of Policy	Office	Year
US Department of Agriculture Loans	Creating and reinforcing markets	USDA	1933
Small Business Association Loans	Creating and reinforcing markets	SBA	1953
National Flood Insurance Program	Creating and reinforcing markets	FEMA	1968
Community Development Block Grants – Disaster Recovery	Distributive policy	HUD	1974
Hazard Mitigation Grant Program	Distributive policy	FEMA	1988
Individual Assistance	Distributive policy	FEMA	1988
Public Assistance	Distributive policy	FEMA	1988
National Disaster Housing Strategy	Strategy	Miscellaneous	2009
Flood Insurance Reform Act	Reform of existing policy	FEMA	2011
National Disaster Recovery Framework	Framework	Miscellaneous	2011
Sandy Recovery Improvement Act	Reform of existing policy	Miscellaneous	2013
Homeowner Flood Insurance Affordability Act	Reform of existing policy	FEMA	2014

Strategies and Frameworks

National Disaster Recovery Framework.

In 2009, President Obama asked FEMA and HUD to develop operational guidance for post-disaster recovery coordination. To address this request the organizations created the Long-Term Disaster Recovery Group, a working group of 20 federal agencies, which produced the National Disaster Recovery Framework

(NDRF). This document serves as the primary guidance document for the housing recovery process. To streamline the recovery process, the NDRF defines roles and responsibilities at the local, state, tribal, and federal government. It also mandates that each level of government establish a Disaster Recovery Coordinator as a central coordinating officer at each level of the government to improve intergovernmental and interorganizational coordination. One of the primary points emphasized in the NDRF is that the response structure it sets up is scalable, flexible, and adaptable based the size of the disaster and community needs. The NDRF is automatically activated in any federally declared disaster, and individual components can be activated whenever necessitated in smaller-scale events. Similar to the National Response Framework, the NDRF uses Recovery Support Functions (RSFs) to delineate facets of community recovery, assigning each RSF a federal coordinating office that is responsible for managing the federal response to that aspect of the recovery effort. The five RSFs include:

1. Community Planning and Capacity Building. Economic.
2. Health and Social Services.
3. Housing.
4. Infrastructure Systems.
5. Natural and Cultural Resources.

RSF 3, Housing, defines pre- and post-disaster housing issues, roles in the housing recovery process, and resources the federal government brings to address this

issue. HUD coordinates long-term housing recovery support for the federal government. The primary agencies are FEMA, Department of Justice, HUD, and USDA. There are a number of supporting agencies that may or may not have a role in the process, including the Department of Commerce, Department of Energy, Corporation for National and Community Service, Environmental Protection Agency, Health and Human Services, SBA, U.S. Access Board, Veterans Affairs, American Red Cross, and National Organizations Active in Disasters. Primary agencies and support organizations are expected to coordinate their activities with HUD and provide support where needed.

In the pre-disaster phase, the NDRF suggests that HUD work with state and local governments to develop sustainable, resilient communities with strong building codes and plans for post-disaster recovery. Following a disaster, federal agencies are charged with supporting the housing recovery effort by facilitating communication and coordination while bringing to bear resources and expertise to resolve any number of issues including land use decisions, conflicting policy and programs, and gaps in planning. This section of the framework emphasizes the importance of timely decision-making in regards to where and how to rebuild following a disaster to produce more sustainable communities following a disaster event.

National Disaster Housing Strategy.

Pursuant to the Post-Katrina Emergency Management Reform Act of 2006, FEMA developed the National Disaster Housing Strategy in 2009. The NDHS serves to summarize the post-disaster housing strategy in the U.S., highlighting key agencies,

roles and responsibilities, and relevant programs and policies. It also outlines challenges and future approaches associated with rebuilding after a disaster. The NDHS separates housing recovery into three phases: sheltering, interim housing, and permanent housing. Since the NDHS is a summary of the overall strategy, much of the material covered by the NDHS falls in subsequent sections that cover specific programs and policies. The NDHS, however, does succinctly outline the methods of recovery the federal government prioritizes. I cover what these policies and programs provide in more detail in their own individual sections below.

The NDHS recommends that households have and communities encourage households to acquire adequate, replacement-level insurance. The strategy notes that this is FEMA's favored method of long-term recovery since they argue that carrying an adequate level of insurance is "the most efficient and equitable form of disaster assistance" (Hayes and Neal 2011:1). Often homeowners do not have insurance, and if they do it is often not replacement-level funding. In this case, funding for housing recovery is a layered process. Federal support can come in a variety of forms based on demands. The SBA and the USDA offer long-term loans with low interest rates to repair or rebuild housing after a disaster, which are the primary source of funding used by communities and the next line of funding after insurance. Private lenders also have a key role in recovery, and in many cases, they can allow households to refinance or defer for a period. These private entities can also work through HUD's FHA and offer federally insured mortgages to households to repair or rebuild to their homes, or even purchase a new home at a discounted rate. Two grant programs, CDBG-DR and the

HMGP, provide funds based on losses to assist with housing recovery. As a last line of federal funding, FEMA offers Individual Assistance (IA) to households to assist with repairs to make homes habitable.

Policies Creating and Reinforcing Markets

National Flood Insurance Program.

The National Flood Insurance Act of 1968 established the Federal Insurance Administration (later renamed the Federal Insurance and Mitigation Administration), which oversees the National Flood Insurance Program (NFIP). HUD originally managed this program, but the NFIP fell under the auspices of FEMA following its formation in 1979. The NFIP offers federally backed insurance through over 80 private insurance companies to homeowners, renters, and business owners located in flood-prone areas. The federal government created the program in an effort to create a new market where the private market was not meeting community needs. More specifically, the federal government created the NFIP to reduce the financial hardship flooding creates for individuals and businesses, and by doing this accelerate the recovery effort (Bin, Bishop, and Kousky 2011; FEMA 2002). Approximately 19,700 communities participate in the NFIP (FEMA 2002).

There are two types of flood insurance available, one for the physical structure and the other for the building contents. Through the program, homeowners can purchase up to \$250,000 of coverage for the structure and \$100,000 for the contents. Businesses can purchase up to \$500,000 of coverage, to cover both the building and its contents (FEMA 2014b). Communities must meet eligibility requirements for

homeowners in those communities to receive the opportunity to purchase flood insurance. To be eligible for the programs, communities in floodplains must adopt minimum floodplain management ordinances. These ordinances include construction standards for new or heavily modified buildings in areas given a 1% likelihood of flooding in any given year (often referred to as a 100-year floodplain), or to state it another way, a one in four chance of flooding during the life of a 30-year mortgage (Burby 2006; FEMA 2014b). These standards generally require new construction be elevated to a level to avoid major flooding damage. Policies also provide funds up to \$20,000 to help NFIP policy owners comply with local floodplain management laws. Policy owners can use these funds, often in tandem with other funding sources, to elevate, flood proof, or demolish their home and relocate (FEMA 2002).

Flood Insurance Rate Maps (FIRM), created by FEMA for each community, demarcates the flood risks in the area. FEMA uses these maps to determine risk and set the price for flood insurance. During the mapping process, FEMA designates areas along the coast as V Zones and A Zones. V zones are the more hazardous designation, are closer to the ocean, and can be subject to waves over 3-feet during storm surge. A Zones are typically directly landward of V Zones but still at risk for storm surge. FEMA has mapped over 150,000 square miles of floodplains through the NFIP (FEMA 2002). Noting that communities built before they had adequate flooding hazard knowledge, buildings constructed before communities had FIRMs receive their insurance at a subsidized rate. New construction, however, had to meet minimum floodplain management ordinances and pay full actuarial rates. Approximately 20% of

existing policies are pre-FIRM subsidized, and FEMA estimates that pre-FIRM homes only pay 35-40% of what their full actuarial rates should be considering the risk (FEMA 2013c).

Concerned that not enough homeowners were procuring flood insurance, the Federal Insurance Administration (FIA) offered heavily subsidized insurance to non-FIRM communities as an incentive to join the program from 1973 to 1980 (Hayes and Neal 2011). Another effective recruitment tool the FIA used was they made flood insurance compulsory for homeowners located within a 100-year floodplain that have a mortgage from a federally backed lender (FEMA 2014a). Lenders outside 100-year floodplains, at their discretion, can require borrowers to purchase flood insurance. In an attempt to discourage reconstruction in floodplains, the FIA prohibited federal agencies from providing financial support, acquiring damaged properties, or reconstructing areas in recognized floodplains that chose to not participate in the NFIP (FEMA 2002).

The funding that supports the NFIP comes from the National Flood Insurance Fund. Premiums paid into this fund cover losses and operating costs. Congress designed this program to cover operating costs (such as mapping) and losses on a “historical average loss year”, not to be adequate for subsequent years with catastrophic losses (Bin, Bishop, and Kousky 2011; FEMA 2002; Hayes and Neal 2011). Ideally, NFIP borrows from the Treasury in catastrophic years, and repays their loans during years with low claims. Due to recent hurricanes, however, the program is currently running at a massive deficit, mainly the result of losses resulting from the

2005 hurricane season and Hurricane Sandy in 2012. Following Hurricane Katrina, Rita, and Wilma in 2005, the NFIP paid out more money in claims, an estimated \$22 billion, than it had for all other events combined since its inception in 1968, leaving the program in \$20 billion dollars of debt to the Treasury (Burby 2006, Hayes and Neal 2009). To keep the NFIP functional, Congress passed legislation that raised the borrowing limit for the NFIP to 30.4 billion dollars so it could respond to claims related to Hurricane Sandy.

Prior to Hurricane Sandy, Congress passed the Biggert-Waters Flood Insurance Reform Act of 2012 (FIRA) as an attempt to make the NFIP financially solvent. FIRA had multiple components that addressed this issue, mainly through the elimination of a number of subsidies that only affected 20% of policies (FEMA 2014c). FIRA removed subsidized insurance rates for, among others, businesses, second homes, and homes in a Special Flood Hazard Area (SFHA) gradually over a four-year period. SFHAs are areas that experienced repeat flooding losses of over 30% of the property value in a single event or cumulative losses over the fair market value of the property. Primary residents lost their subsidized rates when they purchased a different NFIP policy, sold their property, let their policy lapse, or suffered severe or repeated flood losses (FEMA 2014c).

Loans.

If a homeowner did not have adequate insurance to cover flood losses, a number of loan programs may be available. Private loans can fill the gap between what insurance provides and the true cost of repairs or reconstruction. Companies

holding mortgages for disaster victims can also allow temporary payment deferral, or restructure loans following a disaster. As previously mentioned, the SBA and USDA also provide federally backed loans directly to individuals following disasters. HUD can provide assistance through a variety of programs. Private lending companies can provide disaster victims with low-interest, federally backed mortgages and loans through the FHA to rebuild or repair homes. HUD also offers homeowners help finding homes after disaster, and makes homes available at a discounted price for sale to disaster victims (FEMA 2009). These financial options all require a credit check, though, and many not be available to all households. Individuals in these circumstances must rely on their own resources, state- or locally-ran programs, nonprofit assistance, help from family or friends, or the aid options described below.

Distributive Policies

The Hazard Mitigation Grant Program.

Congress created the Hazard Mitigation Grant Program in 1988 as a component of Section 404 of the Stafford Act. The HMGP is a distributive grant program through which states can apply for funding to assist with long-term hazard mitigation efforts following a disaster, providing affected communities resources to build back smarter. HMGP funds are available in presidentially declared disaster areas. State emergency management offices with approved hazard mitigation plans can apply for HMGP funds, and other state agencies, local governments, and non-profit organizations can apply to their states as sub-applicants for HMGP funds. The state is responsible for collecting potential projects from local government, ranking the

proposed activities, and applying to FEMA for the funding. Both states and sub-applicants must provide detailed documentation of the need and plans for the use of the funds. FEMA judges applications based on their eligibility, feasibility, cost effectiveness, and attention to historic preservation and environmental issues (FEMA 2010). Applicants and sub-applicants can use HMGP money for sustained measures to save lives or reduce the cost of repeat hazards (McCarthy 2011).

If FEMA approves the grant application, a third party (typically the state or local government) must provide a 25% match of the total cost of the project and carry out the work. The match can come from a variety of sources, but if it comes from a federal source, it has to come from CDBG-DR funds, which I discuss in the next section. FEMA bases the amount of funds provided on the amount of federal disaster assistance an area receives (FEMA 2010). The HMGP provides States up to:

- 1.15% of the first \$2 billion,
- 2.10% for the portion over \$2 billion and up to \$10 billion, and
- 3.7.5% for the portion above \$10 billion up to \$35.333 billion for approved mitigation activities (FEMA 2010).

Grantees can use up to 7% of funds provided by the HMGP to develop hazard mitigation plans.

In the case of flooding, grantees typically use HMGP money to acquire, elevate, retrofit, or demolish flood-prone properties (FEMA 2002). Using HMGP money for property acquisition within defined hazardous zones comes with several special requirements. First, the property owner must willingly sell the property to the

grantee, and the grantee must not use eminent domain to acquire properties from owners who do not agree to participate. Second, the grantee must offer the property owner pre-event fair market value for the home. Lastly, after acquired the grantee cannot redevelop the property, it must remain open space indefinitely.

Community Development Block Grants – Disaster Recovery.

Congress passed the Housing and Community Development Act in 1974, which consolidated multiple programs offering communities grant funding, creating Community Development Block Grants. These distributive grants serve as flexible sources of funding that communities can apply for to improve their communities through programs that provided resources for activities such as urban renewal or created open space. Under the auspices of the larger CDBG Program, HUD provides CDBG-DR funds, a flexible source of support for long-term disaster recovery. After large disasters, Congress can make supplemental funds available through additional CDBG-DR funds to support disaster recovery. Congress makes these appropriations in the wake of a presidentially declared disaster when IA, disaster loans, and insurance are not adequate to cover the losses, typically in catastrophic situations (HUD 2012).

HUD offers CDBG-DR to promote disaster recovery in cities and states. HUD Headquarters provides oversight for larger grants, and local Community Planning and Development HUD offices oversee smaller grants. These grants are flexible, allowing funded entities to use them for a wide range of activities. Congress loosely prioritizes funding; grantees typically use this funding to support infrastructure, business, and housing recovery. CDBG-DR funds are intended as the last source of funding, and

grantees are supposed to exhaust (or project that they will exhaust) all other possible sources prior to applying for funds. To ensure this is happening, HUD requires that grantees sign an affidavit that certifies they are reporting all other funding received when they apply. While a grantee can use CDBG-DR money in conjunction with other sources (such as HMGP) for one project, the benefits received cannot exceed their documented and projected disaster losses. Since inception in 1974 through April 2012, HUD allocated \$30.2 billion through CDBG-DR funds.

Grantees submit an action plan for how they will use the funds when they apply. Unlike the HMGP, states, local governments, and Indian tribes within presidentially declared disaster areas that have unmet disaster needs and an action plan for the funds are eligible grantees. Grantees, however, must demonstrate the capacity to carry out disaster recovery plans, so in many cases states are the applicants, and they either distribute the money to local government or carry out the programs directly at their discretion. The programs CDBG-DR recommends grantees include in their action plan are broad, including projects to restore infrastructure, rebuild housing, and to boost the local economy. CDBG-DR funds are required (unless HUD grants a waiver) to meet at least one of the national objectives of CDBG: “1) benefit low-to-moderate income (LMI) persons, 2) aid in prevention or elimination of slums or blight, or 3) meet a need having particular urgency” (HUD 2012:20-3).

When established in 1974, HUD established CDBG-DR money with certain stipulations. Programs and activities utilizing CDBG-DR funds must fall within Presidentially declared disaster zones, must meet a CDBG national objective, must be

part of the rebuilding and recovery efforts, and cannot be used to advance a political objective. Grantees, however, can apply for a waiver from HUD to remove these requirements. HUD encourages potential grantees to submit waiver requests that will assist with local community recovery, and recommends that grantees consult with local HUD offices when developing waiver requests to ensure they are properly explaining why their unique situation requires a waiver and how it will assist with recovery. HUD specifies that they will not accept waivers that request waiving requirements regarding discrimination, fair housing, or environmental concerns (HUD 2012).

Public and Individual Assistance.

According to FEMA (2011b) when the President, at the request of the Governor of the affected state, declares a federal disaster, FEMA can provide three main distributive assistance programs based on needs: Public Assistance (PA), IA, and HMGP funds. FEMA provides PA to state and local governments for projects they consider essential to community functioning, including repairing roads, removing debris, repairing water and electrical lines, and repairing or reconstructing government buildings. FEMA decides whether to provide PA based on the per capita impact of the disaster, the severity of recent disasters in the area, insurance coverage, and if PA is best suited to meet the needs of the area (McCarthy 2011). This is provided either as a percentage of the cost of restoration or as a fixed amount.

When authorized, households apply to FEMA for IA to use for temporary housing, to repair or replace a damaged home, or to help with other expenses such as

moving or medical fees. FEMA authorizes IA based on a number of factors, including estimates of damage to homes and infrastructure, deaths, injuries, disruption of essential services, and other sources of insurance and aid available (McCarthy 2011). They only provide this money to assist with replacing a home when individuals do not qualify for other programs, such as a low-interest loan from the SBA. FEMA does not intend for IA to be the primary source of aid for a recovering individual and only applies to losses not covered by insurance. The aid amounts typically provided reflect this intent. The Stafford Act caps the maximum IA provided and adjusts the amount yearly for inflation. When Sandy struck in 2012, the maximum award for a household was \$31,900 with the average award of \$7,825 for homes in New York following Hurricane Sandy and \$6,014 in New Jersey (Haplin 2014). In 2014, the maximum provided per household is \$32,400 (Iowa BHS 2014).

Discussion - Recovery from Sandy

Federal response.

The size and scope of the recovery effort from Hurricane Sandy challenged the current system designed to respond to and recover from disasters. In response to this challenge, President Obama signed two pieces of legislation. The first, the Disaster Relief Appropriations Act of 2013, provided an additional \$50.7 billion to various government agencies to cover costs related to Hurricane Sandy and raised the borrowing limit of the NFIP from 20.73 billion to 30.43 billion (Brown, McCarthy, and Liu 2013). FEMA (2014e) notes that the second, the Sandy Recovery Improvement Act of 2013 (SRIA), “represents the most significant legislative change

to the FEMA's substantive authorities since the enactment of the Robert T. Stafford Disaster Relief and Emergency Assistance Act".

The SRIA focuses primarily on streamlining the aid process for states, communities, and individuals. To do this, the legislation outlines 17 different provisions for FEMA to address to strengthen aid delivery to individuals following disaster. Many of these provisions relate to lessening administrative burdens, especially in respect to acquiring PA (FEMA 2014e). SRIA also asked FEMA to consider how they could reduce losses in future disasters. An interesting part of their response related to housing was to reconsider if recommending hazard insurance as the primary recovery tool was the best option, noting the prevalence of underinsurance and disparities in insurance coverage between the wealthy and poor (FEMA 2013f).

Lastly, SRIA made three changes to the HMGP that, both directly and indirectly, may influence housing recovery. FEMA can now expedite up to 25% (capped at \$10 million) of the funding a state is eligible for so that they can begin projects earlier, which, since households typically rebuild quickly, can assist states in effectively guiding redevelopment. States can also apply for phased projects, receiving funding in chunks so that if they want to buyout an area they do not have to apply for it all at once and can adapt to emerging needs. Lastly, SRIA mandated that FEMA pilot a program called Program Administration by States (PAS), allowing states to apply for the opportunity to administer HMGP money themselves. States want that responsibility because it loosens regulatory oversight, and allows states more control

of how the funds are spent. FEMA judges these applications for PAS based on past performance with HMGP money (FEMA 2014e).

The NFIP also experienced changes following Sandy. FIRA passed months before Hurricane Sandy, which served as a starting point for evaluating many of the changes it brought to the NFIP. Much of the NFIP reform, however, did not last as it appeared in FIRA. President Obama signed the Homeowner Flood Insurance Affordability Act (HFIAA) on March 21, 2014, repealing and softening much of the legislation in FIRA. HFIAA reinstates many of the subsidies removed by FIRA, and offers refunds to many of those affected. With HFIAA, subsidized rates may only increase by a minimum of 5% per year and a maximum of 18% per year. Instead of putting the financial solvency burden on the previously subsidized policies, HFIAA redistributes the cost by instating a \$25 fee for new policies on primary residences and a \$250 fee for processing new policies on second homes and businesses. This fee will exist until all pre-FIRM policies reach full actuarial rates based on risk (FEMA 2014d).

New Jersey.

The state of New Jersey received aid from many of the options described above to address post-Sandy long-term housing. New Jersey received \$422.48 million dollars approved in IA (FEMA 2013d). Through their loans in New Jersey, the SBA approved approximately \$828.5 million in loans for homeowners and businesses (New Jersey 2014a). Within the state, the NFIP paid out over \$3.5 billion in claims (FEMA 2013a).

The state received approximately \$290 million in HMGP funds that it is using on many projects, a number of which address housing (New Jersey 2014a). First, the state set aside \$100 million to reimburse homeowners in floodplains up to \$30,000 for elevating their homes. The state allocated \$100 million HMGP dollars toward an estimated \$300 million dollar project called the Blue Acres Program, which the state is using to acquire 1,000 homes that suffered damage from Sandy and suffer repeat flood losses. The state allocated \$50 million, in portions to each county based on historical risk assessments, toward “resiliency projects to better protect the State in the event of a storm or other disaster” (New Jersey 2013).

In an effort to meet the needs that other sources did not, HUD allocated \$1.83 billion dollars in CDBG-DR money to the state. New Jersey designated a large portion of this flexible funding to support housing recovery. Their Homeowners Assistance Program splits into two options, primarily aimed at keeping communities together and preserving the local tax base. The state set aside \$710 million in funding for eligible homeowners (providing up to \$150,000 per homeowner) for the Rehabilitation, Reconstruction, Elevation and Mitigation (RREM) Program to restore damaged homes. They also set aside \$215 million to give cash incentives to keep eligible homeowners in their community. Through the Resettlement Program, the State of New Jersey paid homeowners \$10,000 to stay in their homes for three years. The state built this program to help homeowners pay for repair costs not covered by insurance, SBA loans, or other aid available. The state also allocated money to help with rental properties. The state set aside \$179.52 million to help property owners build new

rental housing, \$70 million to help property owners repair rental housing, \$40 million to keep rental rates affordable to help lower and middle class families, and \$25 million to help first-time homebuyers purchase a home. Lastly, the state set aside \$6 million to fund an influx of need for local code enforcement and zoning applications (Christie, Guadagno, and Constable II 2013).

New York.

Like New Jersey, New York State also received aid from a number of the sources outlined above. IA provided \$1 billion dollars approved within the state (FEMA 2013e). The SBA provided \$1.5 billion in loans to homeowners and businesses, and insurers paid out \$3.7 billion in flood insurance claims (FEMA 2013b). The New York State Homeownership Repair and Rebuilding Fund and the Empire State Relief Fund also paid out \$29 million, providing \$10,000 to homeowners that still had needs after exhausting FEMA assistance (New York 2013a).

New York State received over \$500 million in HMGP funds following Hurricane Sandy (New York 2013b). Counties that received disaster declarations under Hurricane Irene, Tropical Storm Lee, or Hurricane Sandy were eligible for HMGP funds. The state allocated funds differently from New Jersey, providing funds based on damage assessments made by FEMA for each county. Projects funded do not primarily focus on housing, but rather on increasing the resilience of the infrastructure (New York 2013c).

The state of New York received \$3.8 billion from HUD in the form of flexible CDBG-DR funds to support disaster recovery. Owing to the fact that cities can also

apply directly for CDBG-DR funds, New York City is also receiving \$1.77 billion from HUD. The state set up the Office of Storm Recovery and the “Build it Back Program” to assist with distributing the funding and their recovery effort focusing on meeting needs in four key areas: housing recovery, community reconstruction, infrastructure, and small business (New York 2013d). HUD is distributing the aid to the state in waves, and the state is prioritizing assistance for housing and businesses first. Of the initial \$1.73 billion, the state anticipates spending \$838 million on housing, specifically to repair, replace, raise, or buyout homes. The program splits into two key focal areas within housing recovery: short-term repair (called the Rapid Repair Program) to restore heat, power, and water to homes that are still habitable otherwise, and long-term recovery that focuses on rebuilding communities. While New York does not supply specific dollar amounts as New Jersey does, they do go into a fair amount of detail regarding their buyout program (New York 2013d).

Within the Build it Back Program, New York State created the “Recreate NY Buyout Program”, setting aside a portion of their CDBG-DR funds to buyout properties in high-hazard zones. The state is doing this in a couple of ways. They are providing eligible homeowners with 100% of their pre-storm full-monetary value for their homes if they sustained damage greater than half of their home’s value located within V-Zones on FEMA flood maps. In some situations, they are also incentivizing this deal. The state is offering homeowners an additional 10% just to encourage participation. In addition, they are offering an additional 5% if they relocate within the same county (or just within New York City if they originally lived within city limits),

and an additional 10% for a cluster of homes to try to encourage everyone on a street to relocate and avoid the jack-o-lantern effect. These properties must remain unoccupied in perpetuity. If they are outside of V-Zones but still within the 500-year floodplain, they are offering homeowners 100% of their post-storm value and funds to help with relocation costs. Since HUD considers this latter scenario acquisitions and not buyouts, the state can redevelop these properties (New York 2013d).

Conclusions

Like the recovery process, housing recovery policy is a disjointed domain, populated by policies that reflect different policy goals provided by different interested stakeholders, ranging from federal agencies down to state and local government. Housing policy, due to the Takings Clause, can only influence public housing decisions by offering incentives. Due to recent losses from repeat flooding events and catastrophes like Hurricanes Katrina, the federal government made a concerted effort to define roles and responsibilities in housing recovery. To help bridge our lack of knowledge in this policy domain, this policy review provides a summary of current housing policy in the United States, providing insights from the recovery process with Hurricane Sandy.

Since the recovery process is an ongoing effort and data are still coming in regarding aid received and how the state prioritized and spent the said, it is difficult to draw conclusions this early. Given the options they had though, it is interesting that New Jersey and New York utilized the same policy options, and, in many cases, in different ways. Two primary differences are apparent. New Jersey delegated HMGP

funds based on projects, while New York distributed their HMGP funds based on damages. This suggests more of a hands-on, involved method from New Jersey in project selection and oversight, where New York is making funds available for projects based on damage. When it comes to buyouts, New Jersey is using primarily HMGP funds, and New York is using CDBG-DR funds. The CDBG-DR funds are a bit more flexible, and plans indicate that New York intends to use that to their advantage to “redevelop more resiliently” in 500-year floodplains.

This policy review illuminates a few areas for further research. In the SRIA, FEMA notes that insurance may not be the best way to support long-term recovery, and that more research is necessary. I think this line of inquiry naturally leads to more work on the efficacy and desirability of buyouts in high-hazard, repeat flooding zones. In addition, with the differences in use of HMGP and CDBG-DR funds between the states, there is a chance for a study of the effect that has on project effectiveness, considering the different stipulations for each funding mechanism, public perception of the projects, and the impact this has on the speed and effectiveness of the general recovery effort.

Chapter 5

ANALYSIS, FINDINGS, AND DISCUSSION

In some sciences, testing theories is so straight forward that it is only a slight exaggeration, though it always is in a certain strict sense, an exaggeration, to talk of theories being proved. In others, corroboration is roundabout, an ongoing gradual process by which confidence approaches the threshold of consensus, or fails to. Studying the evolutionary roots of human nature, or anything else, is a science of the second sort. About each theory, we ask a series of questions, and the answers nourish belief or doubt, or ambivalence.

- Robert Wright

In each of the following subsections, I systematically discuss the data analysis, findings, and close with a discussion for each subsection. To streamline this dialogue, I culled propositions into two larger conceptual areas, affective relation to place and functioning, for a number of reasons. First, questions from both the questionnaire and interview often addressed more than one proposition, so streamlining reduces redundancies in the narrative. Second, grouping by conceptual area facilitates reflection on findings in fuller selection of related findings from past studies, rather than splitting this discussion into smaller subsections. Lastly, grouping propositions allows for a more holistic discussion of the findings, allowing the narrative to reflect findings more honestly, rather than shoehorning discussion into individual propositions. Affective relation to place includes a discussion of attachment to place, risk perception, and trust in governance. Functioning covers elements related to pre-

event, policies and plans, resources, damage, and stress. Within each section, where appropriate, I discuss data from both Oakwood Beach and Sea Bright, individually due to differences in the settings (damage, income, and buyout availability, specifically). This also allows for exploration of the differences between the case studies, leveraging the strength of using multiple case study sites.

First, I discuss data reduction and recoding performed. Then, I restate the proposition(s) related to the constructs within the larger conceptual area (e.g. attachment to place under the heading of affective relation to place) to orient the reader, offering both a null and research (or test) hypotheses. Since this study is exploratory and meant to identify important factors in the decision-making process for future, focused studies, research hypotheses are nondirectional. Next, where applicable, I provide a discussion of the questionnaire elements that test each hypothesis within the larger subsection, along with any relevant univariate analysis. Then, I outline the results of any bivariate analysis, only discussing significant relationships and providing alpha scores in the adjacent tables in each section. Next, where appropriate, I discuss qualitative data found relating to each concept. Where relevant, I close the section discussing the relationship between my findings and the existing literature. I address implications of these findings in the subsequent conclusions chapter.

Data Reduction and Manipulation

Factor analysis.

Factor analysis was used to identify factors that explain correlations within observed data and reduce the data into meaningful groups. It is recommended for studies with over 300 respondents (Field 2005). This process creates a correlation matrix for each variable considered, extracts groups of variables based on their correlation coefficients, and rotates them to maximize the relationship between the set variables and the concepts or constructs they measure. This test produces a Kaiser-Meyer-Olkin value, Bartlett's Test of Sphericity, correlation matrix, and scree plot that suggest if factor analysis is appropriate for the variables selected and then tells the researcher how many components to extract. Direct Oblimin (oblique nonorthogonal rotation) was used since the assumption, based on the literature, is that the variables used in each factor analysis are related (IDRE 2014). Variables were chosen for factor analysis based on previous studies that suggest that questions should measure the same concept or construct. A factor analysis was performed on the six Likert questions that explored attachment to place and the seven Likert questions that explored risk perception.

Factor analysis returned one factor for attachment to place. The Kaiser-Meyer-Olkin test returned a score of 0.888, which should exceed 0.6 for an acceptable factor analysis (IDRE 2014). Bartlett's Test of Sphericity was statistically significant (Bartlett 1954). The component matrix showed all of the variables had coefficients over 0.5, which exceeds the recommended value of 0.45 (Starkweather and Herrington

2014). The scree plot revealed no clear breaks and suggested retaining one factor. This result aligns with the literature suggesting that the Likert scale questions related to attachment used in this study should form one component for attachment to place (Raymond, Gregory, and Weber 2010; Semken, Neakrase, and Dial 2009; Williams and Vaske 2003).

Two factors emerged for risk perception. The Kaiser-Meyer-Olkin test delivered a score of 0.724. Bartlett's Test of Sphericity returned a significance of 0.000. The component matrix displayed all of the variables with coefficients over 0.45, with a cluster around 0.8 and a subsequent cluster around 0.5. The scree plot revealed one clear break, suggesting extraction of two components. This also aligns with the literature, which recognizes two dimensions of risk that were measured by the questionnaire, the risk of recurrence and potential impacts (Tierney and Sheng 2001; Lang *et al.* 1986).

Recoding.

It is generally assumed that 10 responses are needed per response category when analyzing ordinal data (Trainor 2008). For analysis, a number of variables were recoded that had low response numbers across the categories of potential responses. These variables were collapsed into aggregate response categories. Due to an uneven distribution in responses to the six Likert questions exploring attachment to place, response categories ranging from "strongly agree" to "strongly disagree" were collapsed to "agree", "neutral", and "disagree". The four questions regarding the recurrence of a similar event, ranging from "strongly agree" to "strongly disagree",

were collapsed to “agree”, “neutral”, and “disagree”. Additionally, the three questions regarding the potential impacts of a similar event that ranged from “very likely” to “not likely at all” were recoded into “likely” or “not likely”.

Another set of variables measuring demographic characteristics of the samples were collapsed to allow for analysis of more nuanced theoretical concepts. Data regarding the makeup of the household was split in a number of ways to see if any measured aspect of it affected household residential decision-making. First, the presence of seniors or children in the home was transformed into a binary “yes” or “no” response. These two variables were also combined to create a similar binary variable that indicated whether a household had any type of dependent in the home or not. These questions about household makeup were also combined to create a variable indicating household size. Income was also manipulated in a number of ways. A variable was created to note if income increased, decreased, or stayed the same after Hurricane Sandy. Income, both pre- and post-Sandy, was also split into “\$99,999 or under” or “\$100,000 or more”, and “below or at median household income” or “above median household income” based on census medians. Due to a lack of variability of race in the samples, race was split into “white” and “not white”. Education was parsed in two ways. First, respondents were categorized into either “less than a bachelor’s degree” or “bachelors or higher”. Second, respondents were split into “less than some college”, “some college or bachelors”, or “more than a bachelors”.

Univariate distribution and manipulation of dependent variables.

As discussed earlier, three questions were used to capture elements of residential decision-making. Table 10 serves as a reference table of the univariate distribution of the dependent variables for the reader to refer to while navigating the analysis and discussion sections below. In Oakwood Beach, 57% of respondents still lived in the same community (referred to henceforth as Same Community) and at the same address (referred to henceforth as Same Address) following Hurricane Sandy, compared to over 80% of respondents from Sea Bright. It is worth noting, however, that 12 Sea Bright respondents (4%) indicate that they moved following Hurricane Sandy, but still lived in Sea Bright. Approximately 48% of Oakwood Beach respondents planned to live at their current residence (referred to henceforth as Reside Plan) for more than five years, compared to 54% of respondents from Sea Bright. This leaves a large portion of the respondents that have some question regarding their residential location within the next five years, including over 20% of respondents in Oakwood Beach predicting they will live in their current residence for less than one year.

Two additional variables were created from the three dependent variables. Since residential status is conceptualized on a spectrum, ranging from “moved out of the community” to “living in the same community at the same address with plans to stay at that residence for more than five years”, two variables were created to try to understand differences along this continuum. First, a binary variable named “committed” was created that indicated whether a resident “lived in the same

community” and “planned to live at the same address for more than five years” or not.

Second, an ordinal variable named “investment” split residents into one of the

following categories, creating an ordinal variable:

1. “new community”,
2. “same community” and “planned to live at the same address for less than one year”,
3. “same community” and “planned to live at the same address for one to five years”, or
4. “same community” and “planned to live at the same address for more than five years”.

There are stark differences between the two communities when considering these two constructed variables. Approximately 72% of respondents from Oakwood Beach indicated that they did not live in the same community or plan to live at their current residence for more than five years, compared to only 42% of respondents from Sea Bright. This difference manifests more when exploring investment, highlighting the fact that indecision exists in both communities, but the number of households that have already moved or are certain they are going to stay for an extended period varies across the sites. Of the respondents from Oakwood Beach, 39% live in a new community, approximately 17% foresee themselves moving in less than one year, and an additional 17% believe they may move in one to five years. In Sea Bright, for comparison, only 9% live in a new community, with only 5% seeing their household

consider a move within the next year, and an additional 27% suspecting they may move in one to five years.

Table 10: Univariate Distribution of Dependent Variables

	<u>Buyout</u> Oakwood Beach, NY		<u>Comparison</u> Sea Bright Borough, NJ	
	n	%	n	%
<i>Do you still live in the same community as you did at the time of Hurricane Sandy?</i> <i>[Same Community]</i>				
<i>No</i>	22	40.7	32	10.6
<i>Yes</i>	31	57.4	262	86.5
<i>Total</i>	53	98.1	294	97.0
<i>Missing</i>	1	1.9	9	3.0
<i>Do you still live at the same address as you did at the time of Hurricane Sandy?</i> <i>[Same Address]</i>				
<i>No</i>	23	42.6	43	14.2
<i>Yes</i>	31	57.4	250	82.5
<i>Total</i>	54	100	293	96.7
<i>Missing</i>	-	-	10	3.3
<i>How long do you plan to live at your current residence? [Reside Plan]</i>				
<i>Less than one year</i>	11	20.4	27	8.9
<i>One to five years</i>	15	27.8	95	31.4
<i>More than five years</i>	26	48.1	164	54.1
<i>Total</i>	52	96.3	286	94.4
<i>Missing</i>	2	3.7	17	5.6
<i>Committed [index variable – Committed=same community, plan to live at same address for greater than five years.]</i>				
<i>No</i>	39	72.2	126	41.6
<i>Yes</i>	12	22.2	156	51.5
<i>Total</i>	51	94.4	282	93.1
<i>Missing</i>	3	5.6	21	6.9

<i>Investment [index variable]</i>				
<i>New community</i>	21	38.9	28	9.2
<i>Same community, less than 1 year</i>	9	16.7	15	5.0
<i>Same community, 1-5 years</i>	9	16.7	83	27.4
<i>Same community, more than 5 years</i>	12	22.2	156	51.5
<i>Total</i>	51	94.4	282	93.1
<i>Missing</i>	3	5.6	21	6.9

Qualitative Coding

As mentioned in the methods section, I had three separate pieces of qualitative data to code: two inquiries from the questionnaire covering pre- and post-event functioning, two additional queries from the questionnaire exploring the process and pitfalls encountered during housing recovery, and in-depth semi-structured interviews with community members. I began by reading and memoing each document extensively, resulting in over 350 memos which aided in the creation of coding schemes, offered a way to track my own disposition toward the data and thought development, and a starting point for many of the following discussions.

Each of these data required a different coding scheme due to the nature of the data and the conceptual areas they probed related to the study. When coding the section related to pre- and post-event functioning, I utilized descriptive coding, categorizing the elements each respondents liked most and least about their community both pre- and post-Hurricane Sandy. Here, I was looking for patterns in the data, seeing what characteristics emerged as most important and what changed post-Hurricane Sandy. The coding process resulted in:

1. 1016 coded section for what they liked most about their community prior to Hurricane Sandy (referred to as Pre-Best),
2. 676 coded sections for what they liked most about their community after Hurricane (referred to as Post-Best),
3. 685 coded section for what they liked least about their community prior to Hurricane Sandy (referred to as Pre-Worst), and
4. 582 coded sections for what they liked least about their community after Hurricane Sandy (referred to as Post-Worst),

with a total of 2959 items coded, and 180 unique codes. Following first-order coding, I used focused coding to identify overarching categories useful for analysis. Findings from these four questions appear in each of the following conceptual areas discussed.

There are a few limitation of this set of questions worth discussing now. First, I asked respondents to tell me about both their pre- and post-Sandy community in a post-Sandy environment, which leaves the chance (and almost confirms) that their post-Sandy perceptions will influence their recollection of their pre-Sandy community. Second, due to lack of depth given in single-word or phrase responses, it was often difficult to organize responses into mutually exclusive concepts. For example, discerning if “small town feel” refers to knowing all of your neighbors (attachment to place) or to the convenience of being close to necessities (environment). This did allow, however, for exploration of trends in the counts of responses, which I explore in subsequent sections. Lastly, there was also a drop in the number of responses from pre- to post, 20% loss in responses from pre- to post-best and 0.4% for pre- to post-

worst. I could speculate as to why this occurred, but it is important to acknowledge that this complicates the interpretation of comparisons across these periods. While a sensible solution might be to compare percentages, small percentages returned for even the largest categories results in a more difficult argument to follow.

I used eclectic coding for the sections of the questionnaire exploring the process and pitfalls associated with housing recovery, allowing me to use process and descriptive coding simultaneously. This was important because it allowed me to capture both what the respondents listed as the steps in the process and their descriptions of the overall process. Again, I employed focused coding to look for underlying themes in the data. This resulted in a set of focused codes that outline emotions evoked by the process of housing recovery, positive and negative descriptors of the steps and process, sets of actions taken, and issues encountered in the process. It is important to note that while the set of codes created appear to portray the process as overwhelmingly negative, I reanalyzed the data after initial coding to look for disconfirming evidence, and conducted extensive lumping and splitting to confirm that my codes represented the nuanced nature of the data as accurately as possible. Findings from these two questions appear in each of the following conceptual areas discussed.

I employed causation coding as my first order-coding scheme for the interviews with residents of each community. Causation coding allowed me to create equations to identify modifiers for residential decision-making processes in the wake of Sandy. Elements that interviewees discussed that influenced the decision-making

process were coded as either direct or indirect relationships or influencers.

Interviewees explicitly stated that direct influencers had an effect on their residential decision-making process, either by offering the information unprovoked or answering a direct question regarding the decision-making process. Indirect influences emerged through the interview, but the interviewee did not directly relate them to their decision-making process. An example of a prominent indirect modifier was a confusing interaction with FEMA. As noted in the literature, both positive and negative experiences, from the moment of displacement, affect the decision-making process, so they are important to our understanding of the phenomenon. I collapsed the causation codes into pattern codes to understand patterns within the factors influencing the decision-making process. Findings from the interviews also appear in each of the conceptual areas discussed. In the case of an exchange between the interviewer and the interviewee, “[S]” indicates that the following quote is from the interviewee, and “[I]” indicates that the following quote is from the interviewer. Numbers distinguish between multiple interviewees and interviewers.

Affective Relation to Place

Attachment to place.

Proposition 4 - Attachment to place may affect household residential decision-making.

H₀: There is no relationship between attachment to place and household residential decision-making.

H₁: There is a relationship between attachment to place and household residential decision-making.

Quantitative analysis.

A panel of six questions was asked to measure attachment to place. As previously noted, three questions measured place identity, and three measured place attachment. Sea Bright residents responded with higher levels of both place identity and place attachment. As detailed earlier, however, these indicators were recoded from a five-point Likert scale to a three-point Likert scale and later collapsed into a singular indicator, termed “Attachment”. Table 11 details the univariate distribution of the three-point Likert scale version of the variables addressing attachment and “Attachment”. In general, residents of Oakwood Beach reported higher levels of place identity (the first three inquiries on Table 11) than they did on questions regarding place dependence (the fourth, fifth, and sixth inquiries on Table 11). In Oakwood Beach, over half of the residents (55.5%) indicated that they were not attached to their community. Alternatively, a majority (60.7%) of the respondents in Sea Bright indicated that they were attached to their community.

Table 11: Univariate Distribution of Recoded Questions Regarding Attachment to Place

	<i>Buyout</i> <i>Oakwood Beach, NY</i>		<i>Comparison</i> <i>Sea Bright Borough, NJ</i>	
	n	%	n	%
<i>Place identity and place dependence [recoded]</i>				
<i>I feel [Oakwood Beach/Sea Bright] is a part of me.</i>				
<i>Agree</i>	31	57.4	230	75.9
<i>Neutral</i>	17	31.5	48	15.8
<i>Disagree</i>	6	11.1	15	5.0
<i>Total</i>	54	100	293	96.7
<i>Missing</i>	-	-	10	3.3

<i>Being in [Oakwood Beach/Sea Bright] says a lot about whom I am.</i>				
<i>Agree</i>	28	51.9	179	59.1
<i>Neutral</i>	17	31.5	82	27.1
<i>Disagree</i>	8	14.8	33	10.9
<i>Total</i>	53	98.1	294	97.0
<i>Missing</i>	1	1.9	9	3.0
<i>I am very attached to [Oakwood Beach/Sea Bright].</i>				
<i>Agree</i>	26	48.1	220	72.6
<i>Neutral</i>	19	35.2	57	18.8
<i>Disagree</i>	8	14.8	16	5.3
<i>Total</i>	53	98.1	293	96.7
<i>Missing</i>	1	1.9	10	3.3
<i>No other place can compare to [Oakwood Beach/Sea Bright].</i>				
<i>Agree</i>	15	27.8	147	48.5
<i>Neutral</i>	18	33.3	88	29.0
<i>Disagree</i>	20	37	60	19.8
<i>Total</i>	53	98.1	295	97.4
<i>Missing</i>	1	1.9	8	2.6
<i>[Oakwood Beach/Sea Bright] is the best place for what I like to do.</i>				
<i>Agree</i>	20	37	198	65.3
<i>Neutral</i>	19	35.2	76	25.1
<i>Disagree</i>	14	25.9	22	7.3
<i>Total</i>	53	98.1	296	97.7
<i>Missing</i>	1	1.9	7	2.3
<i>The things I do at [Oakwood Beach/Sea Bright] I would enjoy doing just as much at some similar community.</i>				
<i>Agree</i>	8	14.8	91	30.0
<i>Neutral</i>	16	29.6	88	29.0
<i>Disagree</i>	29	53.7	116	38.3
<i>Total</i>	53	98.1	295	97.4
<i>Missing</i>	1	1.9	8	2.6
<i>Attachment indexed. [Attachment]</i>				
<i>Agree</i>	23	42.6	184	60.7
<i>Neutral</i>	18	33.3	83	27.4
<i>Disagree</i>	12	22.2	25	8.3
<i>Total</i>	53	98.1	292	96.4
<i>Missing</i>	1	1.9	11	3.6

Table 12 provides an overview of the results for the bivariate analysis comparing Attachment and the dependent variables. Surprisingly, Attachment was not significantly associated with any of the dependent variables for the Oakwood Beach sample, and only weakly associated with living in the same community or at the same address when considering the entire sample. This changes, however, when considering residential plan, where knowing the rank value of their Attachment increases your odds of correctly predicting the rank value of their residential plan by 42.3%. This value is negative, indicating that respondents that indicated higher ranks of attachment also indicated that they planned to live at their current residence (Reside Plan) for a longer period. Likewise, residents that responded with lower levels of attachment were more likely to believe they would move sooner than their higher attachment counterparts. This pattern continues when considering their investment in the area and their commitment to staying.

Table 12: Bivariate Analysis of Indexed Attachment Variable

*Attachment (indexed variable of questions 7-12)
(Low (1) to High (3))*

	Significant Relationship (P-value)	Relative Strength*	Proportional Reduction of Error (PRE) Percentage**
<i>Residential Plan (1,2,3)</i>			
<i>Oakwood</i>	-	-	-
<i>Sea Bright</i>	0.00	-	Gamma (-42.3%)*
<i>CommittedR (0,1)</i>			
<i>Oakwood</i>	-	-	-
<i>Sea Bright</i>	0.00	Moderate*	Tau (10.0%)*
<i>Investment (0,1,2,3,4)</i>			
<i>Oakwood</i>	-	-	-
<i>Sea Bright</i>	0.00	-	Gamma (-38.2%)*

* $p \leq 0.05$. ** $p < 0.01$, *** $p < 0.001$

relative strength based on Phi or Cramer’s V score.

PRE test chosen based on type of variables tested.

Missing values indicates the relationship was not significant.

When looking at individual indicators of attachment, a few other important patterns emerge. Same Community and Same Address were both significantly related to “Best Place”, a question measuring place dependence”, with the sample from both Sea Bright and Oakwood Beach. The sample from Oakwood Beach returned a moderately strong, statistically significant relationship between Same Community, Same Address, and Best Place. The Goodman and Kruskal’s Tau score for the Oakwood Beach sample is much larger than Sea Bright in both cases as well. Analysis of crosstabs shows that respondents that agreed that their community was the best place to do the things they liked to do were more likely to live in the same community and at the same address than respondents were that ranked Best Place lower. The

importance of family history in an area on the residential decision-making process was only significantly related to Same Address in Sea Bright.

The issue of attachment to place becomes more salient when considering Reside Plan, Committed, and Investment. In the sample from Oakwood Beach, the only significant relationship is between Committed and recoded Best Place, and the phi score suggests it is a moderate relationship. The sample from Sea Bright, however, shows a number of significant relationships. When considering the three recoded variables measuring place identity, knowing the rank score a resident gives to those questions gives you an over 40% better chance of correctly predicting the rank score of Reside Status. This relationship suggests residents with higher levels of attachment see themselves living in Sea Bright longer than residents with lower levels of attachment. Similar trends occur for both Committed and Investment, showing that the higher the place identity, the more likely residents are to plan to live in the area for an extended period.

Qualitative analysis – questionnaire data.

When respondents described the Pre- and Post-Best and Worst, a few patterns emerged related to attachment to place. Respondents from Oakwood Beach listed elements related to attachment to place when answering Pre-Best 82 times, with “neighbors” (19) being the most mentioned category, followed by “close to beach” (11), “community” (7), “friendly” (7), “neighborhood” (7), and “nature” (6). Post-Best saw similar numbers for each category, with the exception of a ten-response drop for “neighbors” and an eight-response drop for “close to beach”.

Respondents from Sea Bright mentioned elements related to attachment to place when answering Pre-Best a total of 519 times, with the top five responses of being “close to the beach” (201), close to the river” (58), a “small-town feel” (67), their “neighbors” (51), and “community” (34). Post-Best saw a reduction in this category to 349, with significant losses in respondents mentioning “close to beach” (121), “close to river” (27), “neighbors” (31), “small town feel” (17), and “friendly” (5).

In contrast, when describing Pre- and Post-worst, discussion about attachment to place is scattered across a number of responses, lacking the larger response categories featured in the previous section. The most notable pattern, however, is a lack of focus on traditional aspects of place identity and place attachment. When asked about Pre-Worst, respondents from Oakwood Beach noted “crowding” (7), “neighbors” (4), and “pollution” (5). When asked about Post-Worst, Oakwood Beach respondents highlighted “crowding” (5), “depopulation” (5), a “lack of sense of community” (3), and “miss my neighbors” (3).

Respondents from Sea Bright are almost equally split. The most populated category for Pre-Worst is “tourists” (19), followed by “divisions in town” (13), “crowding” (9), and “overlooked” (8). Interestingly, when considering Post-Worst, “divisions in town” drops to three, “crowding” drops to one respondent, “tourists” drops to four, while “displaced” and “lack of sense of community” appear with seven respondents each.

Interviews.

When discussing the steps in the process or the problems and pitfalls encountered, interviewees were not mentioning their attachment to place, rather they spent their time discussing interactions with both governmental and non-governmental agencies, the number of times and where they moved while displaced, and the long-term recovery stress related to either reclaiming their homes or finding a new home. In the interviews, however, attachment was a focal point of many of the conversations. A number of concepts and constructs related to attachment to place emerged throughout the interviews. In Oakwood Beach, the focus primarily was on place dependence, especially when describing why they chose to live in Oakwood Beach prior to Sandy.

There was four houses that all kept a common area in the back of our homes mowed down so it was large enough that we were able to hold the games there, you know, like softball and wiffleball games, my kids learned how to ride their bikes back there. I had a garden that was about, I'd say anywhere from 40 to 60 square feet, so we had a pool, we had a deck, it was very quiet and peaceful, it was a very nice place to be.

This interviewee described the open space their home provided as an asset that made their home more appealing and created an environment where they created memories with their children and neighbors. This quote also describes cooperation with their neighbors to provide their children with a safe environment to play and a place to congregate and build critical social ties.

Beyond describing what they created in the area, interviewees discussed pieces of Oakwood Beach that made it a unique and desirable setting, particularly in contrast to the congested, dense, and expensive surrounding cityscape.

We actually chose the neighborhood because of its location. Um, it's quiet, it's private, um, and you know, the houses, of course where we lived, were fairly new. We had great neighbors and it really fit our budget also.

What may be more interesting is what interviewees from Oakwood Beach did not discuss. The construct of place identity did not emerge as a prominent theme from the Oakwood Beach interviewees. While interviewees did mention enjoying their neighbors, often, as outlined in the first quote, they discussed communal property shared between neighbors, which is closer to place dependence than identity. There was not a rich discussion about not relocating because of local ties with neighbors, or interviewees discussing the critical social ties they had that endeared them to the area.

When directly addressing their residential decision-making process, Oakwood Beach interviewees often mentioned place dependence. An interviewee that plans to put their house on the market as soon as it reestablishes adequate value to put a down payment on a new home stated that

Everything was so compromised down there that you know, it blew out the seawall, and it blew out the dunes and everything that was down there that they created years ago. Everything was just blown out. I don't think they'll ever be able to recover the houses down there, unless it's with a lot of money.

An additional respondent that still lived in the area mentioned that they had concerns regarding what the area would look like when the repairs completed, noting that they chose the area due to the quiet, secluded setting it offered and feared that might change.

A strong theme that emerged from Sea Bright was that many interviewees never considered moving. Not returning to their home was not an option. When asked

what sort of situation would precipitate relocation for their household, interviewees often responded that they could not imagine any such scenario. As noted by one interviewee

We never even discussed it [relocating]. Seriously, we never even discussed leaving. We just, we knew we were coming back and I wouldn't leave Sea Bright. I wouldn't leave Sea Bright, I wouldn't leave my house, I wouldn't leave my community, and especially after a devastation.

This idea struck so deep for some interviewees that they visibly and audibly reacted, raising their eyebrows, exchanging puzzled looks, and leaving long pauses before responding to this question. In one quote, the interviewee above highlighted the importance of their house (place dependence), their community (place identity), and hinted at the formation of a therapeutic community that strengthened their ties to the area.

Interviewees regularly associated this lack of considering moving with both the strong sense of place dependence and place identity they felt for their community.

When discussing what made their community a physically special place to live (place dependence), one interviewee stated that

There is no place like it in the world, I would say. It's, um, we talk about it all the time, it's like my life is other people's vacation. People pay tons of money to do this. I have to go to work for a few hours, but I mean, I come home, and then it's vacation again.

Like Oakwood Beach, interviewees from Sea Bright spoke nostalgically about what their setting offered, using phrases like "a little slice of Heaven" to describe why they chose to live in Sea Bright, noting they enjoyed being surrounded by water, with the ability to walk to many of the local amenities they enjoyed.

While place identity was a difficult construct to identify in the Oakwood Beach interviews, it was impossible to miss in Sea Bright.

Uh, eclectic, I think, um, there's a cast of characters that live here, um, you know from very colorful characters [pause] um, but a very strong sense of community. So, I've been here a long time, I walk down the street, and I know a lot of people. And I may not know them, you know, friendly, but you know I recognize faces, I know who they are, we're able to say hello. Um, that sense of community, that small town feeling that we're all in this together, all of those things are very, very attractive.

Interviewees from Sea Bright often used the word "eclectic" to describe the community, contrasting it with the surrounding area. They often noted a sense of belonging associated with living in Sea Bright, where many stated that they felt an obligation to their neighbors and the community to stay and rebuild what they lost in the storm.

As hinted at earlier, when describing the community post-Sandy, the idea of therapeutic community surfaced in many of the interviews.

Uh, well the people are still the people. You know, there is, um, there are a lot of helpful hands. Everybody tries to help each other. I've made a tremendous amount of friends that used to live blocks away from me that I'd never met. But through all of the meetings and all of the action seminars we've been too, I guess we kind of formed a bond, some people that have been coming here or living here for a lot of years.

A number of interviewees from Sea Bright noted that, after the storm, they established new bonds with neighbors, whether through community meetings, working together on recovery projects, sharing their despair, or simply being more apt to speak when they see each other.

I mean, it did bring, I did get closer to people that I didn't really even know before. But it did bring a lot of positive. [pause] One of my closest friends at this moment, I met her, because her husband stayed, and the day I came when the police officer let me walk up to the edge of the water, she was walking over the bridge, and I said "they let you over?" and she said "no, my husband's over there" and I said "what's his name? what does he look like? Where do you live?" and found out she lives on my corner, and now we see each other three times a week. A lot of good came out of it too.

Sea Brighters, in some cases like the comment above, described Sandy as a community-building event, leading to new and stronger social bonds throughout the community. This was not, however, a universally held opinion, and I discuss ideas regarding a potential toxic community in subsequent sections.

When recalling their decision-making process, interviewees invoked both ideas of place dependence and place identity, especially when considering not rebuilding in Sea Bright. Harkening back to Emily and Storr (2009) and findings from households affected by Hurricane Katrina, a portion of Sea Bright interviewees suggested that Hurricane Sandy fundamentally altered, and in many cases removed, the physical elements that tied them to their community.

but yeah, even now there's no, there's no... We used to have a drycleaner in town, now there's no drycleaner. We used to have two gas stations, now there are no gas stations. We're driving out of town. There's no bank, like my bank was Valley National. Everything I used to walk down the street to do, I now have to get in the car to do. You know not that it's a big deal to drive to the gas station but it was convenience that we were used to that was taken away, that just changed.

The loss of a number of businesses and buildings materialized in a number of interviews. They discussed these losses in a manner that suggested their loss reduced their quality of life, and the desirability of Sea Bright as a place to live. Interviewees

particularly noted the loss of the library, which a number of interviewees indicated was surrounded by some questionable circumstances and often discussed as the loss of a cultural icon. Like Oakwood Beach, another idea that emerged from Sea Bright focused on perceived changes that would occur because of Sandy.

...it's time for me to go, you know. I'm getting older and it's time for me to go. It's not going to be the same kind of community. It's not going to be a community except for the second homes of wealthy people. It's time to go. I don't have a second home, I'm not rich.

This is an interesting quote because it suggests that the character of the community was changing due to the damage.

Another set of interviewees from Sea Bright focused on the loss of community members and the emotional toll that took on them. Interviewees often, without specifying the uprooted group, noted that the town lost its eclectic nature, which they argued was a valuable part of the town pre-Sandy. A few interviewees described what they called “survivor’s guilt”, noting that they felt convicted by the idea that they were back in their homes, while others still struggled to return or showed no signs of returning.

...on my block alone, a lot of my neighbors are either gone, or you know, new people are coming in and buying those houses. You know it just definitely changed my street, it definitely changed the town....it was very difficult to walk down the street and not...I mean you could tell my husband and I would just walk down the street and burst into tears just because it would overwhelm you at times when you saw buildings with big X's on them, or would say “remember they used to live here?” or “I wonder what happened to this guy, remember we used to see him?” so um, you know, it was really just devastating.

Other interviewees mentioned factors, not associated with Sandy, which pushed them out of their pre-Sandy residence. Interviewees mentioned rising taxes, the suitability of their living space, the absence of programs and good schools for children, and the lack of a yard as reasons they intended to leave before Sandy.

[S]: I don't think I would live here if I had a family though, um, just because there's not really a school here anymore, and um, I know like some families that are here, but I think it's better suited for folks that are young and not married yet or retired.

[I]: And is that mainly just because of school, a lack of school, or?

[S]: Um, I think so... I think it's also based on, you know, kind of what is on Main Street in Sea Bright. There are some restaurants and some bars and different businesses that obviously keep programs for kids. But it doesn't scream family friendly for me, especially since the library is no longer here either. They demolished the library a little while ago, and they're still looking for a spot for it. You know, things like that, I would look for if I had a family.

With the drop in home value, however, many interviewees that either had their house on the market prior to Sandy or intended to put it on the market were now waiting for their homes to regain value before selling. This idea is addressed further under the resources section.

You know so, and just right before the storm our house was on the market, we were trying to get out of Sea Bright, and it was mostly for, we needed a yard for our kids, because we were living in a house I had purchased, and there was now a family of four in there, not one single person, so um, we were just kind of trying to look for something where they could play ball. But we took the house off the market right before the storm hit, and then that plan just went away [laughs].

Risk perception.

Proposition 8 - Household risk perception may affect residential decision-making.

H₀: There is no relationship between household risk perception and household residential decision-making.

H₁: There is a relationship between household risk perception and household residential decision-making.

Quantitative analysis.

It is important to note at the beginning that, as one of the limitations of distributing only one questionnaire to each household, this study examined individual-level risk perception indicators, not household level. The questionnaire tapped two distinct areas of risk perception: the risk of recurrence and the potential impacts of a similar event. Risk of recurrence was asked via a panel of questions where respondents were asked if they thought an event of similar magnitude to Sandy would affect their community in the next five years, the next ten years, the next twenty years, or never again. The questionnaire explored perceived personal risk by asking respondents to indicate the likelihood of damage to their home, injury to themselves or members of their household, and resulting health problems to themselves or members of their household. Respondents were also asked how important the likelihood of a hurricane was in their residential decision-making process. Table 13 details the univariate distribution of the three-point Likert scale version of the variables exploring risk and the two indexed variables for recurrence and impacts.

Table 13: Univariate Distribution of Recoded Questions Regarding Risk Perception

	<u>Buyout</u> Oakwood Beach, NY		<u>Comparison</u> Sea Bright Borough, NJ	
	n	%	n	%
<i>An event of similar magnitude to Hurricane Sandy is likely to affect [Oakwood Beach/Sea Bright] in the next five years.</i>				
<i>Agree</i>	29	53.7	78	25.7
<i>Neutral</i>	11	20.4	128	42.2
<i>Disagree</i>	11	20.4	85	28.1
<i>Total</i>	51	94.4	291	96.0
<i>Missing</i>	3	5.6	12	4.0
<i>An event of similar magnitude to Hurricane Sandy is likely to affect [Oakwood Beach/Sea Bright] in the next ten years.</i>				
<i>Agree</i>	26	48.1	115	38.0
<i>Neutral</i>	6	11.1	89	29.4
<i>Disagree</i>	18	33.3	86	28.4
<i>Total</i>	50	92.6	290	95.7
<i>Missing</i>	4	7.4	13	4.3
<i>An event of similar magnitude to Hurricane Sandy is likely to affect [Oakwood Beach/Sea Bright] in the next twenty years.</i>				
<i>Agree</i>	34	63	163	53.8
<i>Neutral</i>	4	7.4	42	13.9
<i>Disagree</i>	12	22.2	80	26.4
<i>Total</i>	50	92.6	285	94.1
<i>Missing</i>	4	7.4	18	5.9
<i>An event of similar magnitude to Hurricane Sandy is never likely to affect [Oakwood Beach/Sea Bright] again.</i>				
<i>Agree</i>	34	63	197	65.0
<i>Neutral</i>	5	9.3	27	8.9
<i>Disagree</i>	11	20.4	67	22.1
<i>Total</i>	50	92.6	291	96.0
<i>Missing</i>	4	7.4	12	4.0

<i>Risk of recurrence indexed</i>				
<i>Agree</i>	29	53.7	120	39.6
<i>Neutral</i>	10	18.5	106	35.0
<i>Disagree</i>	11	20.4	59	19.5
<i>Total</i>	50	92.6	285	94.1
<i>Missing</i>	4	7.4	18	5.9
<i>Risk perception – potential impacts (of an event [like Hurricane Sandy] within the next ten years) [recoded]</i>				
<i>Likelihood of major damage to your home.</i>				
<i>Likely</i>	42	77.8	211	69.6
<i>Not Likely</i>	9	16.7	82	27.1
<i>Total</i>	51	94.4	293	96.7
<i>Missing</i>	3	5.6	10	3.3
<i>Likelihood of injury to you or members of your household.</i>				
<i>Likely</i>	31	57.4	40	13.2
<i>Not Likely</i>	20	37	253	83.5
<i>Total</i>	51	94.4	293	96.7
<i>Missing</i>	3	5.6	10	3.3
<i>Likelihood of health problems to you or members of your household.</i>				
<i>Likely</i>	35	64.8	55	18.2
<i>Not Likely</i>	16	29.6	238	78.5
<i>Total</i>	51	94.4	293	96.7
<i>Missing</i>	3	5.6	10	3.3
<i>Impacts indexed.</i>				
<i>Likely</i>	35	64.8	58	19.1
<i>Not Likely</i>	16	29.6	235	77.6
<i>Total</i>	51	94.4	293	96.7
<i>Missing</i>	3	5.6	10	3.3

Recurrence showed some dramatic variation between the two samples. In general, respondents from Oakwood Beach saw the risk of recurrence as much higher than their Sea Bright counterparts saw the risk of recurrence. In Oakwood Beach, for example, 41% of respondents strongly agreed that an event of similar magnitude to

Hurricane Sandy was likely to affect their community in the next five years, compared to only 10% of Sea Bright respondents. These numbers tend to converge, however, as the range of years within which the event is to occur increase. Over 60% of respondents in both sites agree that an event like Hurricane Sandy will affect their area again at some time.

Respondents from Oakwood Beach also saw a higher likelihood of impacts from a potential event than their Sea Bright counterparts. Approximately 44% of Oakwood Beach respondents stated that if an event like Hurricane Sandy occurred within the next ten years, it is very likely that their homes would suffer major damage, compared to 28% of Sea Bright residents. Over 30% of respondents from Oakwood Beach thought this potential event would cause injury or health problems for themselves or members of their households, compared to only 5% of Sea Bright respondents. When considering the likelihood of a hurricane, 59% of Oakwood Beach residents indicated this was very important in their household residential decision-making process. This is staggering, compared to only 14% of Sea Bright residents giving the likelihood of a hurricane the same importance.

Bivariate analysis shows mixed results. In Oakwood Beach, when examining the recoded three-point Likert scale questions, both a ten and twenty year return rate along with the chance of a similar event never impacting the area again showed a significant relationship with both Same Community and Same Address, with the phi scores showing a moderate relationship. While some of the relationships between Same Address, Same Community, and risk for respondents from Sea Bright were

statistically significant, none of the relationships were moderate or strong. Analysis of crosstabs shows that the more likely respondents rated recurrence, the less likely they were to live in the same community or same address (or a negative relationship between the variables).

The bivariate analysis regarding Committed and Investment tells a different story. For respondents from Oakwood Beach, none of the risk variables were significantly related to either Committed or Investment. While a number of factors are significant when considering the questions regarding risk perception and Committed for respondents from Sea Bright, all of the phi scores suggest weak to moderate relationships. The strongest relationship, likelihood of damage to your home, only returns a phi score of 0.22, suggesting a moderate relationship (which ranges from 0.20 to 0.40). While a number of factors were significant when considering the relationship between Investment and risk in Sea Bright, many of the gamma values were relatively small. The largest gamma value, at 0.25, was related to risk of recurrence in five years, where analysis of crosstabs suggested that respondents that thought a similar event might occur within the next five years were more likely to not be committed to Sea Bright when compared to respondents that thought recurrence was less likely.

Conversely, buyout decision was significantly related to a number of the variables measuring risk of recurrence for respondents from Oakwood Beach. Table 14 provides an overview of the results for the bivariate analysis comparing the risk of recurrence and Buyout Decision. Both a recoded ten and twenty year return rate along

with the recoded chance of a similar event never impacting the area again showed a significant relationship with buyout decision. The phi score also exceeded 0.40 for each relationship, suggesting a relatively strong relationship. The tau score was also relatively high (between 0.21 to 0.30), suggesting that knowing how respondents from Oakwood Beach felt about recurrence rates for similar events could help better predict if they accepted a buyout offer or not. In general, Oakwood Beach respondents that rated the risk of recurrence higher were more likely to have accepted a buyout offer than respondents that rated risk of recurrence lower.

Table 14: Bivariate Analysis of Buyout Decision

	<i>Buyout Decision</i>		
	Significant Relationship (P-value)	Relative Strength*	Proportional Reduction of Error (PRE) Percentage**
<i>An event of similar magnitude to Hurricane Sandy is likely to affect Oakwood Beach in the next five years.</i>			
<i>Oakwood</i>	-	-	-
<i>An event of similar magnitude to Hurricane Sandy is likely to affect Oakwood Beach in the next ten years.</i>			
<i>Oakwood</i>	0.02	Relatively Strong*	Tau (22.9%)*
<i>An event of similar magnitude to Hurricane Sandy is likely to affect Oakwood Beach in the next twenty years.</i>			
<i>Oakwood</i>	0.02	Relatively Strong*	Tau (23.0%)*
<i>An event of similar magnitude to Hurricane Sandy is never likely to affect Oakwood Beach again.</i>			
<i>Oakwood</i>	0.03	Relatively Strong*	Tau (21.3%)*

* $p \leq 0.05$. ** $p < 0.01$, *** $p < 0.001$

relative strength based on Phi or Cramer's V score.

PRE test chosen based on type of variables tested.

Missing values indicates the relationship was not significant.

Qualitative analysis - questionnaire data.

When examining Pre-Best, as expected, respondents generally did not discuss risk, as it typically has a negative connotation. In both sites, respondents mentioned “security” under Pre-Best, but interviews suggested that “security” referred to protection from crime and not necessarily hazard exposure. When looking at Post-Best, however, respondents did mention perceived reductions in risk. In Oakwood Beach, 21 respondents mentioned “a reduction of hazard exposure”, two mentioned “mitigation”, and ten mentioned “improved housing”, which could be interpreted to be safer housing. In Sea Bright, 15 respondents mentioned “improved housing”, ten mentioned “a reduction of hazard exposure”, and four mentioned they “no longer needed flood insurance”. It is interesting to note that “security” appeared less often in Post-Best for Oakwood Beach (down to two), and more often for Sea Bright (up to 11).

Pre- and Post-Worst, however, present communities preoccupied with risk. “Hazard exposure” (29) is the largest overall response category for Pre-Worst in Oakwood Beach. It drops, however, when considering Post-Worst to nine, while “unsafe” (2) emerges as a category. With 54 respondents from Sea Bright noting “hazard exposure” for Pre-Worst, it is the third largest category overall for that response section. As with Oakwood Beach, however, this drops to 29 for Post-Worst.

As with attachment to place, process and pitfalls was not a section where respondents often commented on their risk perception or hazard exposure. The exception was a portion of the respondents that did not receive a buyout offer from the

state that were interested in one. As one respondent from Oakwood Beach, just outside the buyout zone, put it:

I hope that this information will do us some good...please don't leave us here in danger there are children, handicap, elders, just simple working people trying to be in a safe place. Now even just a heavy rainfall can make me very scared and my neighbors feel the same way. Our lives have changed tremendously.

This quote emphasizes a number of elements. They describe groups researchers commonly note within the disaster literature as “at risk populations”, and in that, suggest that they do not consider where they live to be a “safe place” anymore. By alleging that Hurricane Sandy has left a “risk shadow”, they also acknowledge the stress that even heavy rainfall induces, creating anxiety about another possible hurricane or flooding event.

Interviews.

Risk perception was an interesting item in the interviews due to the variation between the two sites and multiple dimensions of risk identified within the literature that surfaced in the interviews. As with the other data related to risk perception, the construct was more prevalent in interviews from Oakwood Beach than Sea Bright. Interviewees often described themselves as “exposed”, and, in light of the buyout, the ones that rebuilt in situ argued that they felt abandoned and without a viable avenue to reduce their hazard exposure. A compounding factor residents of Oakwood Beach often mentioned is that they also live in an area threatened by multiple hazards, most notably wildfire.

We lived with constant threat of fires, secondary to people at the beaches, as well as the floods because at the end of our street was a creek. So if the floodgates backed up then the creek backed up and then that came back into the street, so we were constantly at risk due to the fires and the floods. So, we were always very conscious of it, at first sign of a fire, we definitely left the area because it was due to the fact that the beach was down at the other end of the block, there was only one way out. Once the fire engines came, it was impossible to get your car off the street so we just always evacuated as soon as we saw any threat of danger.

When describing where they relocated, both the questionnaire and interviews indicated that Oakwood Beach residents often stayed in the general New York City area, but moved away from the coast, attributing it to fear of another storm.

[I]: If you had to move tomorrow, where do you think you would go?

[S]: I would live in the same area. Um, nothing below Hylan Boulevard, which is where all the beach area are down there, where we would feel compromised. But within I would say a six town radius for us of... that is where I'm hoping to look. My husband and my children, you know, this is where they want to stay within the area, just not by the beach.

Interviewees and questionnaire respondents mentioned Hylan Boulevard a number of times. The street served as both a physical and social boundary known by many individuals in the area. Multiple interviewees indicated that living above Hylan Boulevard was relatively safe, where anything below Hylan Boulevard was historically prone to flooding. It also served as the generally accepted northwestern boundary for Oakwood Beach.

Other residents expressed an interest in staying close to the coast, but escaping areas where they felt unsafe. Noting that many questionnaire respondents stated that living near the coast was important, Sandy put them in the position where they often had to choose between living where they wanted to live, or to put it another way, in a

place that has the elements they desire in a setting (place dependence), and feeling safe.

You know, living by the water is beautiful, and it's nice to be close to the beach, but uh, after you experience something like we did, you're certainly going to have your reservations. Unless you're rich and it doesn't matter to you and you're crazy and it doesn't matter to you. We saw people were killed here, and it wasn't just the flood. So, um, no we, we'd have enough distance between us and the ocean, but not too far, I'd like to be able to drive to the beach in a half an hour or an hour, but not live by the beach.

This quote highlights another unique aspect to Oakwood Beach: three people perished in Oakwood Beach because of Sandy, which evidently affected this interviewees' risk perception.

One of the most interesting findings in Sea Bright occurred due to an unanticipated complication in the questionnaire design. Asking interviewees if they "felt safe in their home" consistently required me to reword the question to solicit an answer related to future hurricanes. Generally, individuals asked me to clarify the question, or told me that they were not concerned with crime in the area. When I clarified that my interest related to fear of a future hurricane, often they stated that they could simply evacuate if there was another hurricane, so they were safe. In an interview with a married couple, they indicated that

[S2]: By the way, I've never not felt safe.

[S1]: Yeah. Same here.

[S2]: I mean I've always um, I've always been from the thought of I'm taking care of my family, which means I'm going to the hotel.

[I1]: Right.

[S2]: You know I think the worst thing to do is be a hero. And then you're split up. I mean, I don't understand what that does. I want to be with my family. We all want to be together.

[S1]: We had some people who just stayed in town for the heck of it.

[S2]: Yeah, I'm not even near there. I think emotionally it would be horrible for my sons. It would just be ridiculous.

When probed about the safety of their home, many interviewees confirmed that their home was still at risk in a future storm, acknowledging that they were partitioning their personal and property risk.

You know, I mean our street still floods, so you sort of know that it's likely that this could happen again. So, do I personally, do I think I myself would get killed in the storm? No, because I would evacuate. But do I think my house could get damaged again? Absolutely...

Another interviewee expanded upon this idea associating evacuation with safety, noting that the extended warning time associated with hurricanes allowed adequate time for evacuation to make them complacent regarding their personal safety, but acknowledged that this would not be the case for a tornado or an earthquake, emphasizing the sudden-onset speed of these events.

This was not a universal view, however, and a group of interviewees from Sea Bright indicated that the risk of a future event was too great, and they either had already moved or had plans to move in the near future. This was often associated with a perception that Sandy was not an isolated happening, but a harbinger of future events related to the looming threat of climate change.

Eventually I'm going to sell it. Because you know down the road there's eventually going to be another Sandy...it's just the way it is, with global warming and the sea levels rising, it's just a matter of time.

With this possible future in mind, a portion of residents mentioned that either as they aged or as they began their own family that the risk associated with living in Sea Bright gained importance in their decision-making process. In a number of cases, they

saw these lifetime milestones as a tipping point, where the benefits associated with living in Sea Bright no longer outweighed the risks.

...once I start to plan a family, like I wouldn't, I don't think that I would consider Sea Bright, just because when you see it from the top of the one bridge that's here, it's just the tiniest strip of land. There's water on both sides from the Rumson River too. ...I think with climate change the likelihood of a storm as big as Sandy, if not bigger, is very possible within the next 20-50 years. I mean I love Sea Bright, but I wouldn't put roots down because of that.

Surprisingly, another emerging theme from Sea Bright was that a group of individuals felt safer after Hurricane Sandy. A selection of interviewees noted that living through Sandy gave them a sense of security. Interviewees often hesitated or smiled before they mentioned this feeling, or said something to the effect of "this might seem counterintuitive, but..." indicating that they felt this was an odd or surprising outcome they were about to suggest.

I'm pretty comfortable with the way that I did it [rebuilt my home]. And even if I have to sell it, somebody is going to buy a home that is out of harm's way, completely hurricane proof, um, probably shouldn't say so, because uh, government officials might not be too happy about it. But even if another Sandy is threatened, I'll stay home. I feel that confident with how this house is built. This is how they do it down south where there's, you know, hurricanes all the time, and um, [pause] that's just the way I'd go.

Interviewees stated that Hurricane Irene had negligible effects on their area, and that Sandy, in contrast, was the worst-case scenario. If Sandy set the standard, then they felt they were ultimately safe. Others minimize risk of recurrence, suggesting that they would never live to see another storm like Sandy again, arguing that it was an aberration. Another method interviewees frequently used to minimize their risk was to compare it to other places, suggesting that there is no truly safe place to live, which

implies that they did not see it important enough to move to reduce their risk, or think that moving would reduce their risk.

Uh, I believe [long pause] I believe in my heart that we'll never see a storm like we saw in 2012 ever again. Um, but where do you go where you're not affected? You can go to the Midwest where they have tornadoes ripping up people's houses and throwing them in the air, you go to California and you've got earthquakes and mudslides, so where do you go when you're not affected by weather? There's nowhere safe in the world. Tsunamis are hitting, you know, small islands in the Caribbean and Hawaii. There's just nowhere where you're not going to be affected by Mother Nature. So do I feel safe? Uh, I don't think about it [laughs].

Households may be the smallest decision-making unit in this process, but that does not imply that households are monolithic in the decision-making process. A number of interviewees mentioned that individuals within the home often disagreed as to whether they should rebuild or relocate, generally related to a differential risk assessment. This emerged in both Sea Bright and Oakwood Beach, where often one individual would see the risk as too great and want to relocate, while the other felt Sandy was an extraordinary event unlikely to recur.

[S]: Um, [laugh] well, my husband would sell the house immediately if he could. Um, so it's really kind of been a back and forth, you know he's much more of, like I guess I'm much more of the person who's going to... I like the neighborhood, I really enjoy the quiet and the neighbors, um, you know after the storm we actually kind of did the work that we were looking to do to kind of, to put more value into the home um, so I'm more apt to stay. Where, and I'm more of the belief that you know this kind of storm is not going to happen every year or even every two years. It seems to be just one of those perfect storms where everything just came together, the timing just worked the way it did. I don't see this being an ongoing event.

[I]: Okay.

[S]: Whereas my husband tends to believe, he's more of the doom and gloom kind of person, where he thinks it's going to happen again. So, it's something to explore. If we could have sold last year we might have, but then we looked at the value of the home compared to what it was pre-storm, so we would be

taking a pretty big cut if we sold it now. And since it's been two years, not even, it'll be two years this October.

[I]: Yeah.

[S]: Um, but you know, it's strange how like month to month, the property values have changed. Um, and we just had two beautiful, um, uh, a semi just built right next door to us, so that bought out fast, bringing our property values straight up, but the decision has been kind of back and forth and I think we're just waiting at this point for the right time to sell, even though I wouldn't be too thrilled. I personally want to wait to see what's going to happen once they knock all of the condemned homes down. I know that they're not going to build there anymore, so to me, that makes my property value even higher with less congestion around. So, it's really a matter of where the market value is going with the homes.

[I]: Mhm, so how long do you think you'll be there?

[S]: Um, I'm guessing we'll probably wind up being there at least another two to three years.

[I]: Okay.

[S]: Nothing with the city works fast, so by the time they get... I think we both agreed that at this point, we might as well just wait and see what happens with those other homes and then you know, how that's going to affect it. So yeah, and I don't see that happening any quicker than two to three years from now.

Trustworthiness.

Proposition 10B - Differences in trust in governance among households may affect residential decision-making.

H₀: There is no relationship between the perceived trustworthiness of government and household residential decision-making.

H₁: There is a relationship between perceived trustworthiness of government and household residential decision-making.

Quantitative analysis.

When considering the role of trust, respondents from both Sea Bright and Oakwood Beach indicated how important trust was in their residential decision-making process. Since buyouts were only available in Oakwood Beach, the questionnaire asked residents of Oakwood Beach about the importance of the trustworthiness of organizations running the buyout program (which many of them

saw as the State of New York). Table 15 displays the univariate distribution of the two questions addressing trustworthiness. Approximately 59% of Oakwood Beach residents indicated that their perceived trustworthiness of organizations running the buyout program was very important in their residential decision-making process. Both communities were asked about the importance of the trustworthiness of community leaders. Over half of respondents in both sites noted that this was an important factor in their residential decision-making process.

Table 15: Univariate Distribution of Questions Related to Trustworthiness

	<i>Buyout</i> <i>Oakwood Beach, NY</i>		<i>Comparison</i> <i>Sea Bright Borough, NJ</i>	
	n	%	n	%
<i>Trustworthiness of organizations running the buyout program</i>				
<i>Not Important At All</i>	8	14.8	-	-
<i>Not Very Important</i>	2	3.7	-	-
<i>Somewhat Important</i>	7	13	-	-
<i>Very Important</i>	32	59.3	-	-
<i>Total</i>	49	90.7	-	-
<i>Missing</i>	5	9.3	-	-
<i>Trustworthiness of community leaders</i>				
<i>Not Important At All</i>	8	14.8	40	13.2
<i>Not Very Important</i>	5	9.3	31	10.2
<i>Somewhat Important</i>	8	14.8	85	28.1
<i>Very Important</i>	29	53.7	115	38.0
<i>Total</i>	50	92.6	271	89.4
<i>Missing</i>	4	7.4	32	10.6

Interestingly, bivariate analysis showed that in Oakwood Beach, trust was only significant when compared to the buyout decision. The phi score (0.651), indicates a strong relationship between the variables. The tau score, 0.42, suggests that knowing

the degree to which a respondent believes that the trustworthiness of the buyout organization was important in their residential decision-making process improves the chance of correctly predicting whether they accepted a buyout offer by 42%. Crosstabs show that respondents that considered the trustworthiness of the buyout organization as important were more likely to accept a buyout than respondents that did not consider trustworthiness important. No other combination returned statistically significant results in Oakwood Beach or Sea Bright.

Qualitative analysis - questionnaire data.

When discussing the best and worst parts of their community, as well as the process and pitfalls associated with housing recovery, respondents did not directly address the trustworthiness of any level of government. There were, however, indications that trust was an issue in Sea Bright. Covered further later in this manuscript, respondents listed “local government” as one of the worst things about their community, both pre- and post-Sandy. When asked how important trustworthiness of community leaders was in their residential decision-making process, respondents found creative ways to express their feelings on this question. A number of respondents underlined “trustworthiness”, crossed the word out, or annotated it with “ha ha!”

While people were not directly discussing a lack of trustworthiness, respondents from Sea Bright did mention individuals, by name, in the local government, questioning their motives when discussing community recovery in the Process and Pitfalls section. These allegations, in every case, related to either

questioning the equitability of the distribution of aid or the motives of the individual, often suggesting underlying personal glory or gain drove their actions. Two individuals called the Disaster Research Center to let me know that they were not returning the questionnaire due to fear of reprisal from the local government, and still refused to participate after I explained the lengths I went to in order to protect their confidentiality. During site visits to Sea Bright, I encountered multiple individuals and groups that suggested that there were unspoken divisions in the town. Through conversations, residents let me know that they discarded my questionnaire for the same reasons cited by callers. Attempts to dissuade this mentality were, unfortunately, futile.

Interviews.

These allegations, however, did not appear in the interviews. When asked about the local government, a majority of the interviewees gave shining reviews of their efforts after Hurricane Sandy. One interviewee stated that "...so I would say that the town council and our mayor really uh, stepped up to the plate and hit several home runs after the storm." Interviewees suggested that an overburdened, volunteer force local government performed superbly in the face of insurmountable odds. They lauded the long hours they worked to help the people of Sea Bright, even as the storm affected their own homes, families, and lives.

So Dina Long is the mayor of Sea Bright and she's really kick *** and she lost her home in Sandy...with her commuting, back and forth every day, and they're still trying to make progress on her home now, almost two years later....I had no idea that she didn't live there [in her home in Sea Bright]

because she was constantly, constantly there doing the best that she could for everyone...

While interviewees did not suggest anything nefarious was happening, negative assessments of local government centered on the speed of recovery and the logic behind the prioritization of aid distribution. While residents questioned if beach clubs should receive aid before homeowners, they did not suggest that local government did this in secret or in an untrustworthy manner, they simply challenged the judgment.

Discussion.

Attachment to place.

As noted in the literature review, attachment to place is one of the most agreed upon factors in the disaster literature influencing the residential decision-making process. Researchers suggest that this social construction of place beyond the physical elements of place links households to a setting, leading them to want to rebuild in the same spot after a disaster (de Vries and Fraser 2012; Emily and Storr 2009; Haas, Kates, and Bowden 1977; Mileti and Passerini 1996; Oliver-Smith 1991). In this study, the relationship between attachment to place and residential decision-making processes at a household level was explored in three ways. First, respondents answered six Likert-Scale questions exploring place identity and place dependence. Second, respondents listed the best and worst things about their community, both pre- and post-Sandy. Interviewees also often described issues related to attachment to place when describing their residential decision-making process.

The quantitative data show that there is a relationship between attachment to place and residential decision-making, showing support for proposition 4. There are levels of subtlety, however, to that relationship. First, while the questions collapsed into one extractable factor as the literature suggested they should, it showed no significant relationships within the Oakwood Beach sample when compared to the dependent variables, and only weak associations in Sea Bright. The exception to this was when considering Reside Plan, which suggested that individuals that reported higher levels of attachment in Sea Bright were more likely to think they will live in Sea Bright for an extended period when compared to their less attached peers. While not an altogether surprising finding, it does offer evidence that attachment influences longer-term residential plans, and that future studies should avoid a binary approach to relocation and resettlement and instead expand their definition of the phenomenon. When considering individual indicators, it is interesting that Best Place was significantly related to Same Address and Same Community for the Oakwood Beach sample, suggesting that respondents that thought Oakwood Beach held unique physical characteristics for them were more likely to stay in the area following Sandy.

The qualitative analysis showed evidence of attachment to place in both the Pre- and Post-Best and Worst section and the interviews. When exploring responses to Pre-Best, there are more than enough responses related to attachment to place to account for each respondent listing at least one attachment to place indicator in both study sites. While these responses are dominated by elements related to place dependence in Oakwood Beach, they favor place identity in Sea Bright. Interestingly,

in Sea Bright there are hints of a corrosive community when considering pre- and post-worst.

Sea Bright interviewees often indicated, rather surprisingly considering the damage Sandy inflicted on the area, that they never considered moving. They often attributed this to their attachment to their place, highlighting both the unique, tangible elements of their community that made it a desirable place to live, even in the wake of sandy and the social ties that existed both before and that developed after the storm. Interviewees that had either already relocated or had plans to relocate in the near future often discussed both perceived physical and social changes post-Sandy that they felt made the peninsula spit made it an undesirable place to live.

When explored in a vacuum, the qualitative findings suggest that attachment to place is a critical consideration in the decision-making process. Interviewees that rebuilt and relocated both indicated that attachment to place served as a catalyst for rebuilding their home or for relocating to a new setting. The quantitative findings support this finding. Univariate statistics grouped at the polls of attachment: a majority of the respondents felt either very attached or not attached at all to their community. Bivariate statistics added nuance to this, showing that one of the key differences between people that rebuilt and relocated lies in their place dependence. When asked where they would move if they did move, a majority of interviewees that decided to rebuild stated that they would either remain near the coast or try and find a similar community. Future studies should replicate this mixed methods approach in new settings to see if place dependence emerges as prominently in non-coastal settings.

This is a contribution to the disaster literature for a number of reasons. First, this offers a more nuanced measure of attachment than previous studies offered. Second, no known study in the disaster literature has employed this Likert-Scale in a post-disaster community, and using it offers a chance to employ a validated measure of attachment to place in disaster settings. Third, triangulating findings allows for further validation of findings. It is important to note that this exploration of place attachment has limits. The questionnaire serves as a post-event assessment of attachment. I suspect that a pre- and post-test of attachment would return different results. Since this is a novel application of this measure, people who have relocated may naturally feel less attached to the area, which may not be true in a pre-test.

Risk perception.

The role of risk perception in the residential decision-making process, and the domains of recurrence and impact contained within, is understudied, but widely agreed upon as a critical factor in that process. A shortcoming of this body of knowledge, however, is that we know little of how these decisions unfold in a home. Most studies focus on an individualized understanding of risk, while studies exploring relocation and resettlement efforts often focus instead on key stakeholders at a community level, excluding the household (Fraser *et al.* 2003; Smith and Handmer 1986). While authors like Lindell and Perry have made major advancements explaining evacuation behavior, the body of knowledge on long-term decision-making lacks literature exploring the mechanisms by which risk perception translates to mitigative behaviors

(Kirschenbaum 2005). For this study, risk was measured through a validated Likert-Scale measure on the questionnaire and interviews.

The questionnaire showed that, in general, risk perception was related to household residential decision-making. Oakwood Beach respondents thought an event like Sandy was more likely to recur, and be more damaging if it did, than their Sea Bright counterparts. Bivariate analysis demonstrated mixed results. In Oakwood Beach, there was a moderate relationship between risk and immediate (Same Address and Same Community) relocation decision-making at a ten and twenty year return rates. In Oakwood Beach, respondents that thought there was a higher chance of a repeat event were more likely to have moved. This same relationship was also relatively strong when compared to buyout decision, suggesting that respondents that thought the chance of recurrence was higher were more likely to accept a buyout offer. Weak to moderate relationships emerged in Sea Bright for Committed and Investment when compared to a number of the proxies for risk, suggesting that individuals that thought a repeat event was more likely to occur were more likely to think they may relocate in the near future.

The qualitative data suggests that, as expected, risk was in the consciousness of both communities in the wake of Sandy. When describing the pre- and post-worst things about their communities, hazard exposure emerges as a predominate issue in both communities. The interviews supported the questionnaire finding that suggested that residents of Oakwood Beach were more concerned with future hazards than Sea Brighters. Many interviewees that relocated, or that had decided to relocate but were

waiting to sell their home, emphasized the role risk perception played in their decision-making process. They would often acknowledge that this was a multifaceted decision, and that while they may feel attached to their community, the risk was too great to persist in an area.

The quantitative and qualitative data generally agree regarding the role of risk perception in household residential decision-making. The higher perception of risk in Oakwood Beach, however, could be explained in a number of ways. In interviews, residents of Oakwood Beach often harkened either back to the nor'easter of 1992 or the constant threat of fires the community lives with. While similar, Oakwood Beach also sustained more damage from Hurricane Sandy relative to Sea Bright. In future studies I recommend researchers control for these issues. These findings might also offer further insights on variation within attachment and the two communities. Emily and Storr (2009) suggested that attachment might have a damage threshold, beyond which attachment diminishes. More relative damage in Oakwood when compared to Sea Bright might explain lower levels of post-event attachment in Oakwood.

Trustworthiness.

Literature that explored trust in both local government and organizations running buyout programs is limited, but suggests two major findings. First, trust in government is essential for a successful relocation or resettlement effort. Individuals that did not trust local government were less likely to participate in a buyout than individuals that did trust their local government. Second, these studies found that groups that trusted the government were more likely to view their involvement in a

relocation effort (or buyout) as voluntary (de Vries and Fraser 2012; Fraser *et al.* 2003; Perry and Lindell 1997). To explore this topic, respondents were asked about the importance of the trustworthiness of organizations running the buyout program in Oakwood Beach and of community leaders in both settings in their residential decision-making process. In general, this study found limited evidence to support this idea.

While respondents from both case study sites agreed, in general, that trustworthiness was important, a larger proportion of the respondents from Oakwood Beach indicated it was an important issue. When using bivariate analysis to explore the relationship between trustworthiness and residential decision-making, the only relationship that was statistically significant was whether Oakwood Beach respondents decided to accept a buyout offer. This was one of the strongest relationships found in the study. Variations within the qualitative findings related to trustworthiness were limited, since a majority of interviewees from both settings had an overwhelmingly positive assessment of local government.

The data related to trustworthiness, when considered as a whole, portrays the following pattern. A number of informal conversations with Sea Bright residents suggested that a portion of the residents see a highly fractured town, where leadership is not trustworthy and generally harbor selfish, hidden agendas. The questionnaires hint that a portion of the population does not trust the local government, and questions the equity of aid distribution. Trustworthiness was a non-issue in the interviews. This suggests that one of three, or a combination of the second and third, scenarios

occurred. First, this pattern was random, a result of poor representation in the sample, and I serendipitously found the malcontent few. Second, this pattern was not random, and as contact between the resident and myself became more identifiable and, in turn, traceable, residents that did not trust the local government became less likely to participate in the study. Third, as the time commitment increased, residents with a negative view of their local government became less likely to participate in the phases of the study, and vice-versa. Based on the data, it seems the second or third scenarios are more likely the case, which may have implications on other portions of the findings. I revisit this threat to validity in the conclusion.

Functioning

Pre-event.

Proposition 7 - Minority status may affect household residential decision-making.

H₀: There is no relationship between minority status and household residential decision-making.

H₁: There is a relationship between minority status and household residential decision-making.

Proposition 9A - Pre-existing, negative conditions may affect post-disaster residential decision-making.

H₀: There is no relationship between pre-existing, negative conditions and household residential decision-making.

H₁: There is a relationship between pre-existing, negative conditions and household residential decision-making.

Proposition 10A - Demographic differences among households may affect residential decision-making.

H₀: There is no relationship between demographic differences among households and household residential decision-making.

H₁: There is a relationship between demographic differences among households and household residential decision-making.

Quantitative analysis - race and sex.

Respondents answered a panel of questions borrowed from the American Community Survey that explored demographics in the study area. Table 16 displays the racial makeup and gender of the samples. Annual household income both pre- and post-Sandy, another demographic factor potentially related to household residential decision-making processes, is discussed under the “resources” heading later in this chapter. Reflective of the general demographic trends noted by the Census, there is little racial or ethnic variability in either case study site sample. Out of a 54-person sample in Oakwood Beach, less than 7% identified as a racial category other than white. The sample from Sea Bright was even more homogenous: 96% of respondents identified as white. Asian was the largest minority representation in both sites. Gender of respondents showed some unexpected variability. Approximately 59% of respondents in Oakwood Beach were female, compared to 46% in Sea Bright.

Table 16: Univariate Distribution of Race and Gender

	<u>Buyout</u> Oakwood Beach, NY		<u>Comparison</u> Sea Bright Borough, NJ	
	n	%	n	%
<i>What is your race?</i>				
<i>White</i>	50	92.6	281	92.7
<i>Black or African American</i>	-	-	1	.3
<i>Asian</i>	3	5.6	7	2.3
<i>Other (please specify)</i>	1	1.9	5	1.7
<i>Total</i>	54	100	294	97.0
<i>Missing</i>	-	-	9	3.0
<i>What is your sex?</i>				
<i>Female</i>	32	59.3	139	45.9
<i>Male</i>	22	40.7	156	51.5
<i>Total</i>	54	100	295	97.4
<i>Missing</i>	-	-	8	2.6

There were no significant relationships found between race and the dependent variables, potentially due to the lack of variability in the samples. Even with the variability in gender, there were no significant relationships found between gender and the dependent variables. This is to be expected, though, considering past research that suggests that this decision is made at the household level. This suggests that individual-level indicators may hold little value for household level decision-making, unless we are extrapolating their response to the household, which we cannot do with gender, but may be able to do with other variables.

Quantitative analysis - age and household composition.

In addition to questions about race and sex, the questionnaire asked respondents about their age, household composition, and education level. Table 17

displays the univariate distribution of those variables mentioned above. Both sites reported a high concentration of dependents in the home, especially in the form of elderly individuals. In Oakwood Beach, over 35% of respondents indicated that they had a senior over the age of 64 in their home, compared to 42% in Sea Bright. This is also reflected in the average age of respondents. In Oakwood Beach, the mean age for respondents was 54, compared to 60 in Sea Bright. The distribution of dependent children in homes, however, showed more variability.

In Oakwood Beach, 37% of respondents indicated they had a child in their home under the age of 18, compared to only 18% of Sea Bright respondents. When looked at together, 65% of Oakwood Beach respondents had at least one dependent in their home, compared to 56% of Sea Bright respondents. When considering the education level of the sample, Sea Bright respondents had higher levels of educational attainment, on average, than Oakwood Beach respondents did. In Oakwood Beach, over half of the respondents did not have a bachelor's degree, compared only 12% of Sea Bright respondents.

Table 17: Univariate Distribution of Age, Household Composition, and Education Level

	<i>Buyout</i> <i>Oakwood Beach, NY</i>		<i>Comparison</i> <i>Sea Bright Borough, NJ</i>	
	n	%	n	%
<i>Average Age</i>				
<i>Mean</i>	54		60	
<i>Age categorized</i>				
23-38	6	11.1	18	5.9
39-54	21	38.9	80	26.4
55-70	24	44.4	127	41.9
71-86	3	5.6	56	18.5
87-102	-	-	10	3.3
<i>Total</i>	54	100	291	96.0
<i>Missing</i>	-	-	12	4
<i>Seniors in your home over 64?</i>				
<i>No</i>	34	63	166	54.8
<i>Yes</i>	19	35.2	126	41.6
<i>Total</i>	53	98.1	292	96.4
<i>Missing</i>	1	1.9	11	3.6
<i>Children in your home under 18?</i>				
<i>No</i>	33	61.1	238	78.5
<i>Yes</i>	20	37	54	17.8
<i>Total</i>	53	98.1	292	96.4
<i>Missing</i>	1	1.9	11	3.6
<i>What is the highest degree or level of school you completed? If currently enrolled, mark the previous grade or highest degree received. [recoded]</i>				
<i>Less than some college</i>	21	38.9	35	11.6
<i>Some college or bachelors</i>	20	37	154	50.8
<i>More than bachelors</i>	12	22.2	145	34.7
<i>Total</i>	53	98.1	294	97.0
<i>Missing</i>	1	1.9	9	3.0

When compared to the dependent variables, age did not show any significance for either sample in the residential decision-making process, even when collapsed into

the categories shown above. Household makeup, measuring the effect of the presence of dependents, also was not found to be significant in either sample. Education level, no matter how it was recoded, also was not significantly related to the residential decision-making process.

Qualitative analysis - questionnaire data.

Fortunately, respondents did not mention demographic characteristics as the best or worst parts of their community, as a problem or pitfall of the housing recovery process, or in the interviews. There was data, however, related to pre-event functioning. Respondents from Oakwood Beach listed 23 unique items as Pre-Worst. Of the 107 responses, 56 related to the natural environment, including the aforementioned “hazard exposure” (29) and “insects” (11). The next largest category was the “DEP station” (9), the wastewater treatment plant noted in the case study overview. An additional set dealt with other people in the area, including “crowding” (7) and “neighbors” (4). Respondents from Sea Bright, in contrast, present a more scattered picture of their pre-Sandy community, listing 55 unique items under Pre-Worst, totaling 577 responses. A number of the responses relate to traveling and amenities in Sea Bright, including previously mentioned “traffic” (127), “lack of parking” (50), “lack of downtown options” (25), “tourists” (19), and “bars and drinking” (14). Other factors relate to government and housing, including “local government” (44), “dilapidated” (43), “taxes” (17), and “police” (12). Interestingly, 13 respondents from Sea Bright indicated that there were no negatives associated with living in Sea Bright prior to Sandy.

Policies and plans.

Proposition 1A - Federal, state, and local policy may affect household and community residential decision-making.

H_{0a}: There is no relationship between federal, state, and local policy and household residential decision-making.

H_{1a}: Federal, state, and local policy affect household and community residential decision-making.

Proposition 1B - Knowledge of FEMA's HMGP funding may be an important influence in this process.

H_{0a}: There is no relationship between knowledge of FEMA's HMGP and household residential decision-making.

H_{1a}: Knowledge of FEMA's HMGP affects household residential decision-making.

Proposition 1C - Knowledge of HUD's CDBG funding may be an important influence in this process.

H_{0a}: There is no relationship between knowledge of HUD's CDBG funding and household residential decision-making.

H_{1a}: Knowledge of HUD's CDBG funding affects household residential decision-making.

Proposition 9B - Pre-event disaster recovery planning may facilitate community resettlement.

H₀: There is no relationship between pre-event disaster recovery planning and household residential decision-making.

H₁: There is a relationship between pre-event disaster recovery planning and household residential decision-making.

Proposition 11 - Policy is the product of multiple interested parties working toward a common goal. Without buy-in from these stakeholders, it is highly unlikely that new policy will be instated or that voluntary resettlement will be achieved.

H₀: There is no relationship between stakeholder buy-in and successful policy implementation.

H₁: There is a relationship between stakeholder buy-in and successful policy implementation.

Proposition 13 - The nature of, or lack of, recovery and resettlement planning may affect resettlement outcomes.

H₀: There is no relationship between recovery and resettlement planning and household residential decision-making.

H1: There is a relationship between recovery and resettlement planning and household residential decision-making.

Qualitative analysis - questionnaire data.

Qualitative components from the questionnaire and interviews offer a number of insights on the role of policies, programs, and plans at a community level, and how they influenced their personal housing recovery effort. Questionnaire respondents wrote, at length, about policies and programs when describing the process, problems, and pitfalls associated with housing recovery. At a federal level, respondents most often noted the role of FEMA and SBA. Since questionnaires returned as written text and were not part of a dialogue, often it was impossible to sort out whether a respondent was referring to FEMA IA or a NFIP policy claim when describing interactions with FEMA. Flood insurance is an interesting item to categorize because it is subsidized in most cases, so it does enable households to underwrite their risk and live in areas at a prorated cost for insurance. Where possible, however, I delineate between the two in this discussion. A majority of the conversations regarding state aid centered on programs established by each state with their CDBG-DR funds from HUD, including the previously mentioned Build it Back Program in New York and the Rehabilitation, Reconstruction, Elevation and Mitigation (RREM) Program in New Jersey. While responses varied, they focused on concepts related to paperwork and a long process, confusion, and a portion of positive assessments of the process.

Paperwork and a long process.

Respondents often used terms like “difficult”, “farce”, “fighting”, “hassle”, “impossible”, “joke”, “lost cause”, “nightmare”, “tedious”, and “useless” to describe the process, noting that, to say the least, it was not pleasant. Often, these comments were associated to the paperwork and multiple contacts to agencies required when applying for aid. The amount of paperwork and confusion associated with the forms required was one of the most consistent themes in the Process and Pitfalls responses. A number of respondents detailed the repetition in the process, noting that they filled out the paperwork (which they described as a “phonebook”), only to have the same forms requested again later.

The mind-numbing paperwork, phone calls to nameless people from FEMA, insurance companies, federal and state aid organizations have been a difficulty for people who are suffering. NJ seems to be punished due to a failure in Katrina! We deserve better than what we are getting in service from insurance, FEMA, federal, and state aid agencies. They say the grant money is already gone. How am I going to raise my home? Where is my federal money?

This quote also emphasized another idea that materialized in some of the responses. Many respondents from Sea Bright compared their experience to individuals affected by Hurricane Katrina. Often, the context was that FEMA was punishing NJ residents for “failure that happened during Katrina”. It is difficult to be more specific about what they meant by “failure”, but the idea of “punishment” almost always followed complaints about the amount of paperwork.

Respondents not only described the process as long, but also as laden with anxiety-inducing uncertainty. Sea Bright respondents indicated that they were

waitlisted for aid, often without knowing where they were on the list, and to their understanding, they could not start work until the state approved their aid application. A portion of respondents indicated that they had applied for the aid immediately after Sandy and were still on waitlist at the time they completed the questionnaire. To put this into perspective, if they decided they wanted to rebuild *in situ*, they had to relocate and pay rent on a temporary space while displaced, pay their mortgage, constantly follow up on aid applications, and wait while their house potentially deteriorated due to standing water and mold, which they cannot fix due to their understanding of regulations.

Confusion.

As noted in the previous section, respondents had a difficult time navigating the paperwork. Often, respondents saw the repetition required on their end as a lack of coordination within the government. These feelings often centered on inconsistent messaging from FEMA, with one respondent noting that “at first I did not know where to turn. It seemed as though FEMA did not know either. I got a different answer every time I contacted them.” Respondents were suggesting FEMA was losing paperwork, asking for the same items multiple times, and deleting people from the system. While this repetition may seem harmless, respondents noted the stress this added, and one noted that “Submitting redundant information monthly to FEMA was the main reason of feeling like a criminal”. While it is important to acknowledge the workload many agencies experienced after Sandy, respondents noted that interactions with FEMA were generally unpleasant and perceived as unsympathetic.

After many battles with FEMA I finally received my file and notices that someone had doubled my salary into their computer. Too bad...so sad. DENIED! ... Every conversation with FEMA people was horrible. I asked one FEMA rep if I should move my family back to my gutted home and he replied "if that's what you have to do." I told him it was 17 degrees in New Jersey...he said "yeah, so I've heard".

Although it is impossible to verify the claims of this respondent and a handful of others that make similar allegations without violating a number of privacy laws, these encounters are important to note because they reflect the perceived experience of individuals with government aid.

FEMA was very unsympathetic. They told us to take pictures of everything we lost which I did. Spent a fortune to send them – they gave me nothing – I even went as far as appealing their decision and got nowhere.

Past negative interactions, respondents conveyed a consistent undertone suggesting that FEMA was understaffed and that individuals FEMA hired to assist with the response did not receive adequate training.

The process of trying to get my house repaired has been confusing, arduous and overwhelmingly expensive, much of this is due to the confusion, ignorance and incompetence I have encountered from every level of government and government agency. Initially, and even now with only modest improvement, FEMA, federal, state, and local governments have failed to communicate effectively to Sandy victims. Especially in the early post-storm months, information was not disseminated to Sandy victims either accurately or equally. I called FEMA reps many, many times - about 80% of the time, they contradicted what other reps said.

A second element that the quote above captures and the subsequent quote exemplifies is that respondents did not see this as a linear process. By nature, linearity implies that there is a path to follow and the steps are clear. What was consistent across the Process and Pitfalls questions, however, is that respondents often gave

assessments of the process, substituting emotional responses to interactions with organizations and agencies instead of an orderly, clear, and bounded description of the steps in housing recovery.

The steps in recovery from 10/29/12 were unimaginable. The red tape and disorganization with Federal and State aid were unexplained and unbelievable unless you were in it you could NOT comprehend what it was like. “Horrible” is a good word to describe it; another “agonizing” another “confusing”. It would take me pages and pages of steps, which I could not possibly write down.

This respondent above notes that, even if asked to and given adequate space, they could not detail the steps, potentially because they had trouble conceptualizing the steps themselves, emphasizing how inappropriate it is to describe this as a step-by-step process.

A number of respondents from Sea Bright mentioned confusion, noting changes in policies and programs, which may explain a portion of the perceived variability in the process. One interviewee highlighted this by stating that “NJ programs made up as went along, constant, unannounced changes in program criteria, incompetently slow, staffed by nice, but unqualified staff.” However, this was not everyone’s experience. Some respondents noted changes in the program as a positive adaptation to needs, stating that “we initially did not apply for RREM grant because we were already building, but then applied because they made it a reimbursement grant as well”.

Local government was also the subject of discussion for Sea Brighters. Respondents noted that the demand overwhelmed a number of municipal services

essential for recovery, like the local building permit office. Like FEMA, respondents also noted a lack of consistent information from the local government. While acknowledging that Sandy also affected them, one respondent noted that

My local/municipal government reps acknowledged they had no clue about pretty much anything. Things did not improve for about a year granted muni govt was wiped out, themselves Sandy victims. Even months later, they could not handle the volume of permits, inspections, etc. The offices were a mess, even losing my and my neighbors seal-survey and other paperwork.

Insurance also presented its own set of unique issues. There was a lot of discrepancy in Sea Bright between what residents thought was covered and what insurance was willing to pay for. One of the repeat issues was whether standing water resulted in water or moisture damage. Flood insurance does not typically cover moisture damage, and was a point of contention on a number of claims. Respondents that lived in condominiums often had issues when their association's policy would not cover a claim, and their secondary policy refused as well because the association's policy was not maxed. This situation led to the common sentiment of "why did I even have two policies then?"

While a portion of respondents mentioned aid in the area, such as the work of Benjamin Moore to repaint downtown Sea Bright, others mentioned that while they saw efforts to raise funds, they were not sure where the aid was going. One respondent indicated that "all we saw were charity events on TV for Sandy Victims, but never knew where any of that money went. Certainly no one in my area!" Others in Sea Bright challenged the prioritization and equitability of recovery funds.

I applied for aid....was put on waiting list. Very frustrating when 4 neighbors receive \$10,000 and we got nothing. After several phone calls I have gotten no answers.

In Sea Bright, respondents questioned whether prioritizing beach clubs and businesses made sense, without residents back in homes to support their operations. There were also hints of a toxic community, where a handful of respondents suggested that certain areas of the community received preferential treatment, where the local government ignored other areas. One respondent indicated that “the town did NOT help us at all, town turned their back on [redacted street name]. Had to pay for all debris removal....out of our own pockets”, affirming the divide in the community, and suggesting that their only hope was to take care of themselves.

Positive assessments.

While the themes that emerged from the Process and Pitfalls questions were overwhelmingly negative, there were some positive chords. When speaking about the recovery process, a portion of respondents praised the organizations and agencies working in the area, noting the critical role the aid played in their housing recovery process. On the local level, some respondents acknowledged the role the local government played in the process, even applauding the efforts of individual members of the local government by name. When appraising the early to middle portion of the recovery effort, one respondent said that “the town of Sea Bright was extraordinarily helpful. From volunteers to help with clean-up, to speedy and frequent removal of debris, to simplifying the process to get permits”. Another respondent noted that FEMA helped them when they had no one else to turn to, stating that “FEMA

provided a hotel room for me (a few months). FEMA then provided an apartment for me in Fort Monmouth, NJ. I don't know what I would have done without the apartment". As the discussion transitions into the interviews, note that many of the following themes identified in the interviews reflect the topics that emerged in the Process and Pitfalls section described above.

Interviews.

Resettlement program.

Through the Resettlement Program, the state of New Jersey offered homeowners \$10,000 for a pledge that they would stay in their current residence for three years, which helped people fill in the gap where insurance and other aid was inadequate. As one respondent described the funding "I got the \$10,000 um promise-you'll-live-in-Sea-Bright-for-three-years uh, money which was a no-brainer for us". In contrast to the complaints interviewees had regarding other grant programs, they often praised the Resettlement Program, noting that this source of aid was relatively easy to receive and arrived relatively quickly. They stated that this money filled the time-gap where other aid had not arrived and played an important role in their short-term recovery.

It's an important community and that's why that \$10,000, I mean the money was great, but the thought behind it, to keep people here, I thought was wonderful to say that I'm not going anywhere for three years. Um, that was good because, you know, like I said, people on my street, a lot of them didn't come home and if you just take that one street, and that happened on every street, and what if that was what Sea Bright turns into, a ghost town? What if that was Sea Bright? It just became a ghost town.

As noted in the quote above, often interviewees understood, and supported, the intention of this incentive program. Others, however, took the grant, fully intending to move after the three years, suggesting that they were “counting down the days till they could move”.

Paperwork.

As a whole, Sea Bright interviewees, however, did not view other grant programs as favorably as the Resettlement Program.

[S1]: But with the, even the \$150,000 [RREM Program], you know, it costs more than \$150,000 to fix your home. To raise just the one piece of house that we have is over \$80,000, so okay that’s half that grant right there. We got less than that from insurance. But see, how do you do it? How do you make it work? And if they just said that yes, you were damaged, and yes, you qualified, no questions asked, here’s the 150, like they did with the \$10,000 grant, resettlement grant that they gave to people to stay.

[S2]: Right. It was a bribe.

[I2]: Right.

[S1]: But it was easy! You applied for it online and within three weeks you got a check.

[I2]: Right.

[S1]: It should be that easy for the rest of it. Instead of, you know, pummeling people even more.

[S2]: Yeah, so, an answer is an answer, so unfortunately, we’ve all been really through the wringer with being told, help is on the way, we’re going to provide help for you.

[S1]: We have to jump through hoops to get the help.

[S2]: But do you qualify for help? You know, I don’t know...

A consistent theme in the data was that the paperwork associated with grants, loans, and insurance, consistent with the Process and Pitfalls findings, was tedious, overwhelming, confusing, and, at times, not considered worth the time and resources required to complete. Interviewees described anxiety they felt when new paperwork would arrive, with one interviewee stating that “Yeah, every time a giant envelope

comes in the mail it's like Oh no! My God, this is going to take me hours." They described the time the paperwork and application process consumed as a full-time job in itself, and one interviewee poignantly called it "the second disaster".

[S2]: So, [long pause] going through this entire process, which takes a year or more honestly, uh, because don't forget you have to sure up the rental situation. And funds that could be available to pay for bills and furniture and things like that. This is hard work, hard work. You have to be dedicated; you have to have a lot of energy.

[S1]: You have to carry a giant bag around with you filled with about 15 folders filled with paperwork.

[S2]: Because when you apply, it's a phonebook to apply. Okay, and then after you fill out your phonebook, then there's another phonebook right behind it. So it's constantly filling out these gigantic forms.

This process was experienced as so tedious that a portion of interviewees simply quit returning the paperwork, thereby removing themselves from the process. Interviewees indicated that they incurred considerable personal debt on credit cards, debt that they thought the state might reimburse them for through the RREM Grant Program, which they were conceding to pay themselves because the process associated with attaining grant funds was not worth it.

But I have to say, on the grant process, I have completely given up on. There is not a single time that I make a phone call where I don't get a different answer. I know almost nobody who has gotten any grant money...How much more disgusted could I be and how could I possibly express that. I'm an intelligent person, I hold a responsible position. I'm management. How could I be that stupid that I can't get my way through this? It can't be...What's facing me on the other side is complete disorganization, rules that seem to pop out of nowhere. If you fulfill one, then you have to go to the other one, nobody tells you about the other one. In my town, they've lost my land survey with the seal on it at least once. My neighbors had theirs lost too. It's like reinventing the wheel every month.

Confusion.

The other element this quote above emphasizes is the confusion associated with the grant programs. When speaking about the Resettlement Program, the quote below notes a lack of information and accessible information sources.

[when speaking about the Resettlement Grant] And we couldn't get information. I couldn't even figure out what process they were using. I couldn't figure out why we were on our waiting list and our neighbors got money. Did it have to do with income level? Was it randomly selected? Every time I called, I got different answers from people. I couldn't get an actual, solid... I still don't know what's actually the truth.

Another important element highlighted by this quote is questions about the equity of grant distribution. Because of either confusion over grant distribution or actual inequities, a number of interviewees noted frustration over neighbors in similar financial situations receiving more grant funding than they secured, suggesting that they applied for the grants around the same time and through the same channels.

As noted in the Process and Pitfalls, interviewees suggested that FEMA was less of an ally and more of a barrier to their housing recovery effort.

Like the person that I talk to, you know. Like I can't tell you how many phone conversations where there was just no compassion, where there was no trying to troubleshoot, no help. It was all, I used to call it, so do, but FEMA disaster resistance instead of assistance, because you're just like, you know, you're grieving and you're scared and you've, you've lost everything and this program, which I pay for, they're resisting everything that I'm trying to say and do and accomplish. So, there's absolutely zero right with FEMA.

Interviewees called FEMA a slew of obscene phrases, often implying that they were incompetent and unsympathetic. Interviewee questioned FEMA's experience in assisting hurricane-affected populations, bewildered that this agency accrued the

experience of responding following Hurricane Katrina, but was unable to respond to their standards following Sandy.

Others, in contrast, suggested that what they considered a poor response was a result of errors made in response to Katrina. When on this topic, interviewees took up the lack of reimbursement programs, stating that this was a result of what they saw as corruption and misuse of funds following Katrina.

So it's kind of like, they were good and bad because people weren't working as fast as they wanted to because they were trying to wait for their paperwork to get back to get money so they could start on these programs, and the people who put in the work in were almost punished because none of those programs were reimbursement programs, so they spent all of their money and didn't have any help from the government in that way, so. I think, I guess a little bit more hindsight with those types of programs would have been good.

Compounded with confusion over what recovery activities were and were not reimbursable, fear of a lack of remuneration paralyzed interviewees to inaction. In effect, interviewees stated that grant programs punished affected households with the ability to begin repairs immediately.

Okay so then you've got to sit for a while. It's a chess game, you got to sit, you can't make a move until you've looked at everything and you got to make the best decisions you can, so some people think you've got to make a move now and other people say you shouldn't do anything and you have to wait. So, in this whole grand scheme of things, you have to hurry up and wait. [laughs] That's how I would describe things.

Adaptation.

Initially, New Jersey homeowners were not eligible for reimbursement on any repair work they began before applying for the RREM grant. HUD, the source of this funding, instated this rule prior to Sandy in an effort to prevent duplication of benefits,

repairs that do not meet new safety standards, and to protect historical properties. This changed eight months after Sandy, however, when pressure from Governor Christie and Congressman Pallone pushed HUD to change the policy, allowing for reimbursement for work started before applying for funds, but not after households submit an application. Pressure to lift this last barrier, however, was unsuccessful.

This is just one example of the types of changes, or adaptations to meet actual needs, which occurred in the wake of Sandy in New Jersey. Through interviews, individuals involved in policy development lauded these changes, noting that they changed stiff regulations to help disaster-affected populations. Households, however, do not always see these changes as positive.

[S2]: Also, there could be reimbursement or there might not be anything. So, so, but you have to understand that. In this language that I'm talking about, there are multiple, multiple programs. So you have to understand what you can do and what you can't do.

[S1]: At one point, they did say, you can be reimbursed. You know, but that changed somewhere along the line and thank God we didn't tear our house down because at one point, we were going to. We were talking to the neighbor behind us who bought the property next to us and we were going to do it together, and then all of a sudden we learned that if you knock it down, you're ineligible for the grant. And we were like, really?

[S2]: Yes, honestly, it was like, we were this close to knocking it down because everyone was saying that you had to tear your house down and then you would save on your property taxes, your town is going bankrupt, so I would be like, wait a minute, let me think of this, you don't want me to pay my taxes and my town is going bankrupt, but I love living here, so wait, don't I want to pay my taxes? Don't I want to help my town?

As pointed out by the quote above and the preceding section, interviewees already have trouble understanding the programs available, and this is complicated by

changing guidelines. Interviewees also suggested that communication regarding the intentions of the regulations and changes to requirements was missing.

Every time you think maybe you qualify, they come out with some additional letter that says you need to give them more information. And their latest thing is “Oh if you want to qualify for the grant...” I already know I’m not qualified because they started before, and they say if you stick the shovel in the ground, you get disqualified. That’s what I’ve been told. If there’s been any update, who knows? They didn’t tell anybody about the updates so the distribution of the information is poor. So now they’re saying you have to sign a letter of a right of entry, where FEMA and I think it’s the DEP come on your property and assess it. I said, “Assess it for what? Other people didn’t have to go through this and now we have to?”

A number of interviewees mentioned that they were not told when regulations changed, and existed in a constant limbo of not knowing where they were on the RREM waitlist or if they did or did not qualify for additional grants. As highlighted by the interviewee below, however, information that they felt was less relevant had no issue reaching them.

There’s no consistency, no fairness, no communication. I got a first class mailing the other day to inform me that the grant materials are available in Spanish. Are you kidding? Like they weren’t already and the website didn’t already say so? Why did they have to send a first class mail that way because somebody has a job to just do that? My taxes are paying for it!

Order of incentives.

While the government designed and envisions recovery aid as a linear process as described above in the Policy Review, interviewees regularly challenged this conceptualization, suggesting that they did not see the logic in this order and actually found it to be a barrier to their recovery.

So in the meantime I have the pressure from the bank to close on this mortgage and chances are, that’s going to happen now, way before this grant, if it at all

comes in. I don't know even if I'm going to be able to get the grant, so how do you budget this? You know, I mean, I might just have to turn around and put a "for-sale" sign on my house and all of this is going to be for nothing.

Many interviewees described a similar situation to the quote above. Often interviewees discussed receiving a small grant early (from FEMA or in the form of the Resettlement Program from New Jersey), contacting their insurance company, then applying for a number of other funds, primarily in the form of a second mortgage, an SBA loan, or the RREM program. The issue emerged when one of another source of funding had a deadline, or pressured to interviewee to finalize that funding without knowing what else they would receive. For example, often interviewees described feeling pressure from the SBA to finalize a loan while still being on the RREM waitlist.

They lamented feeling forced to close on a loan they were unsure they could afford, without the RREM grant money to pay it back. One interviewee exemplified this situation, stating that "Absolutely. Yeah. If I don't get any of that grant money, I'm probably going to have to... there's... God forbid I lose my job, this loan amount is huge!" Many interviewees simply did not take the SBA loan, and if they did accept the loan they suggested, as described in the quote above, that they would not be able to afford their home if they did not receive grant funding and consequently would sell it in the near future.

Initially I was approved [for an SBA loan]. But at that point, I didn't want to close on a loan when I had no idea what I was going to do or what my budget was going to be. That was not easy either, that was such a pain. That was a pain and that was the only, they were pushing me to close on that loan and I'm like okay so, you have the money to loan me while I wait for my insurance money to come in and you cannot collect interest on it? Does that make sense? And then when your insurance money comes in the first payoff is your SBA

loan. So what's it really about? It just didn't make sense to me. So then I kept pushing it off, not knowing how it was going, what if I was going to do, how it was going to piece it together...

Coverage.

Grant programs were not the only source of surprises for recovering households. When they contacted their insurance companies in the wake of Sandy, a number of interviewees expressed surprise and frustration when discovering the chasm between what they thought their policies covered and what their insurance companies deemed as covered. Much of the confusion centered on what flood insurance companies treated as living space and therefore covered under flood insurance and what was and was not damage from floodwaters. As noted in the quote below, interviewees saw the policies in place that determined what was and was not covered as nonsensical and cumbersome.

So the damage to the garage wasn't covered. But it would have been covered had we had a basement. I mean you can't make these things up. I said, "If we were stupid enough to have a basement in a house that's at 12 inches above sea level, you would have covered that? But you won't cover a major flood?" And their answer was "yeah, you got it." So that was also a little bit discouraging. The government help is none, zero, in fact they are our enemy, both statewide and especially FEMA.

This quote also portrays another important caveat to the perception of FEMA and insurance companies: a number of the interviewees had federal flood insurance and did not distinguish between FEMA and insurance. When coding, just like in the Process and Pitfalls section, it was often not possible to dissect data referring to interactions with FEMA and interactions with insurance companies. While I initially asked interviewees to clarify, I quickly learned that they did not separate the two in

their minds. This is important to acknowledge when analyzing attitudes and assessments given by interviewees toward both entities.

Um, we expect, when you go to work and you earn money, and you pay taxes and you pay insurance, we never, we never expect to uh, to want to have to make a claim. I've never made an insurance claim in my life. I have great insurance, just like everybody else does, because you know, you have to protect your investments. My car insurance, my homeowner's, my valuables, you know everything that I have been paying for my entire life, it turns out to be... you know, I might as well have just flushed the money down the toilet because the insurance companies do not cover the losses that we have encountered due to Hurricane Sandy because of the location of our home, because of the manner in which it was built, and you know, if you say that to me, then I can go somewhere to a private enterprise and buy insurance, a little bit more expensive, but I can make an effort to go out and self-insure, but they don't tell you this. The flood insurance carriers and the homeowner's insurance carriers, they don't spell it out in language that the common person can understand. All they did was collect premium year after year after year and when it came time to pay for a loss, I was not covered for anything on my ground floor. I spent about \$200,000 constructing my ground floor in my home that's a \$2,000,000 home and I got almost no help from my insurance companies or the township. It was just, we were on our own. We didn't really have anybody to lean on.

The frustration in the quote above is palpable. The interviewee notes that their frustration with insurance extends past that agency, leading to feelings of abandonment and a need for self-reliance.

A common theme in both the questionnaire responses and the interviewees was confusion over the difference between "flood" and "moisture" damage. They lamented the fact that their insurance would deny a claim, suggesting that it was due to moisture and not flooding, alleging that this distinction caused the damage to fall outside the bounds of their policy.

So they're wasting money there, they're spending it stupid. And we're not, we've been out of our home for almost two years, if we had gotten that check

on day one, we could have been home, instead of them telling us we're not covered for the damage under our house because it was moisture. Come on it was the Atlantic Ocean! That was in all their reports, "sorry you're not covered..." And then asking around, we found out that this was the language that they were using with every – lots of people to deny coverage for damage under the house. Which they're calling normal moisture settling or something like that.

In Sea Bright, interviewees highlighted the idea that if it was actually moisture damage, then it affected their homes because there was the two-week period where they could not legally access their homes. To complicate this issue further, interviewees hesitated to start work, even water removal and cleaning in many cases, due to the aforementioned fear that this would nullify their chances for a reimbursement. Therefore, if they started work on their home, they thought they would be ineligible for compensation in the form of a grant, but if they left the standing water, it resulted in uncovered moisture damage.

Resources

Proposition 2 - The availability and perceived voluntariness of buyouts may affect household residential decision-making.

H₀: There is no relationship between the availability of buyouts and household residential decision-making.

H₁: The availability of buyouts affects household and community residential decision-making.

Proposition 6 - Household income and access to resources may affect household residential decision-making.

H₀: There is no relationship between household income and household residential decision-making.

H₁: There is a relationship between household income and household residential decision-making.

Proposition 12 - The existence of and work of emergent groups may affect residential decision-making.

H₀: There is no relationship between the existence of and work of emergent groups and household residential decision-making.

H₁: There is a relationship between the existence of and work of emergent groups and household residential decision-making.

Proposition 15 - The availability of affordable, appropriate housing may affect resettlement outcomes.

H₀: There is no relationship between the availability of affordable, appropriate housing and household residential decision-making.

H₁: There is a relationship between the availability of affordable, appropriate housing and household residential decision-making.

Proposition 16 - Financial incentives offered may affect household residential decision-making.

H₀: There is no relationship between financial incentives offered and household residential decision-making.

H₁: There is a relationship between financial incentives offered and household residential decision-making.

Quantitative analysis – buyout offer.

To explore the role a buyout offer played in residential decision-making, respondents were asked whether they were offered a buyout or not, and the response to this question was then compared to their responses to the questions that measured the dependent variable. Respondents were not asked about the perceived voluntariness of the buyout due to space issues on the guide, and to avoid leading questions. The intention was to explore voluntariness during the interviews, but, as mentioned earlier, I did not interview any homeowners from the buyout area due to issues attaining interviewees. The sole interviewee that lived within the buyout area was renting their home at the time of Hurricane Sandy. Since the state of New Jersey did not offer buyouts in Sea Bright, these questions were only asked of residents of Oakwood Beach. Table 18 displays counts for whether respondents indicated they were offered a

buyout and whether they accepted that offer. Out of the 54 respondents from Oakwood Beach, 34 indicated that NYS offered them a buyout, and 29 indicated that they had accepted the buyout offer.

Table 18: Univariate Distribution of Buyout Offer and Decision for Oakwood Beach Respondents

<i>Were you offered money for your home (a buyout)?</i>		
	n	%
<i>No</i>	20	37
<i>Yes</i>	34	63
<i>Total</i>	54	100
<i>Missing</i>	-	-

<i>Did you accept the [buyout] offer?</i>		
<i>No</i>	5	9.3
<i>Yes</i>	29	53.7
<i>Total</i>	34	63
<i>Skipped</i>	20	37
<i>Missing</i>	-	-

Table 18 provides an overview of the bivariate analysis comparing the responses to this question to the dependent variables. As expected, residents of Oakwood Beach offered a buyout were more likely to relocate out of their community. The phi score, -0.55, is one of the strongest in the study, and indicates a relatively strong relationship. The Goodman and Kruskal's tau score is also one of the larger values in the study (0.302). This suggests that knowing whether a household received a buyout offer increases the likelihood of correctly predicting whether that household relocated outside of their community by 30.2%. Analysis of crosstabs indicates that respondents who were offered a buyout were also more likely to not live at the same

address. There was not a statistically significant relationship between how long residents thought they would live at their current residence (residential plan) and whether they were offered a buyout. Commitment and Investment were both significantly related to a buyout offer, but did not carry the relatively high predictive power of knowing the response to same community or same address.

Table 19: Bivariate Analysis of Buyout Offer

33. Were you offered money for your home (a buyout)?
(No (0), Yes (1))

	Significant Relationship (P-value)	Relative Strength*	Proportional Reduction of Error (PRE) Percentage**
			<i>Same Community (0,1)</i>
<i>Oakwood</i>	0.00	Relatively Strong***	Tau (30.2%)***
			<i>Same Address (0,1)</i>
<i>Oakwood</i>	0.00	Relatively Strong***	Tau (25.6%)***
			<i>Residential Plan (1,2,3)</i>
<i>Oakwood</i>	-	-	-
			<i>Committed (0,1)</i>
<i>Oakwood</i>	0.02	Moderate*	Tau (11.4%)*
			<i>Investment (0,1,2,3,4)</i>
<i>Oakwood</i>	0.00	Strong***	Tau (16.7%)***

* $p \leq 0.05$. ** $p < 0.01$, *** $p < 0.001$

relative strength based on Phi or Cramer's V score.

PRE test chosen based on type of variables tested.

Missing values indicates the relationship was not significant.

Quantitative analysis – household income.

As noted in the case study descriptions, household income in both of these areas is higher than their respective states. This trend held in the sample, both pre- and post-Hurricane Sandy, and there was little change in percentages in each income category from pre- to post-Hurricane Sandy. Table 20 displays the distribution of

income in both samples. In both Oakwood Beach and Sea Bright the average (mode) household income pre-Sandy was \$100,000 to \$199,999. In general, the household income in Oakwood Beach clusters between \$60,000 and \$200,000 (66%). Approximately 50% of respondents in Sea Bright reported their household income over \$100,000 annually.

While the overall percentages did not shift significantly pre- to post-Sandy, there were some notable changes. Approximately 17% of Oakwood Beach residents reported that their household income dropped the year after Sandy, compared to 11% of Sea Bright residents. While no Oakwood Beach residents reported an increase in income post-Sandy, 4% (13 households) in Sea Bright did report an increase in income.

Table 20: Univariate Distribution of Income Pre- and Post-Hurricane Sandy

	<u>Buyout</u> Oakwood Beach, NY		<u>Comparison</u> Sea Bright Borough, NJ	
	n	%	n	%
<i>What was your total household income before taxes for the year 2011 (the year prior to Hurricane Sandy)?</i>				
<i>Less than \$20,000</i>	3	5.6	10	3.3
<i>\$20,000-\$39,999</i>	4	7.4	14	4.6
<i>\$40,000-\$59,999</i>	3	5.6	32	10.6
<i>\$60,000-\$79,999</i>	13	24.1	25	8.3
<i>\$80,000-\$99,999</i>	9	16.7	26	8.6
<i>\$100,000-\$199,999</i>	14	25.9	83	27.4
<i>\$200,000 and up</i>	2	3.7	67	22.1
<i>Total</i>	48	88.9	257	84.8
<i>Missing</i>	6	11.1	46	15.2
<i>What was your total household income before taxes for the year 2013 (the year after Hurricane Sandy)?</i>				
<i>Less than \$20,000</i>	2	3.7	13	4.3
<i>\$20,000-\$39,999</i>	5	9.3	20	6.6
<i>\$40,000-\$59,999</i>	2	3.7	31	10.2
<i>\$60,000-\$79,999</i>	13	24.1	23	7.6
<i>\$80,000-\$99,999</i>	10	18.5	36	11.9
<i>\$100,000-\$199,999</i>	13	24.1	64	21.1
<i>\$200,000 and up</i>	3	5.6	70	23.1
<i>Total</i>	48	88.9	257	84.8
<i>Missing</i>	6	11.1	46	15.2
<i>Change in income from pre- to post-Sandy.</i>				
<i>Decrease</i>	13	16.7	34	11.2
<i>No Change</i>	35	64.8	210	69.3
<i>Increase</i>	-	-	13	4.3
<i>Total</i>	48	88.9	257	84.8
<i>Missing</i>	6	11.1	46	15.2

Household income, no matter whether it was split pre- or post-Hurricane Sandy, below or above the median, or above or below \$100,000, was not significantly

related to household residential decision-making. While I consider the work of NGOs a resource for homeowners, I save the discussion regarding the influence of NGOs in the residential decision-making process for proposition 12, which more directly deals with the issue. Another potential resource that may affect the residential decision-making process, the role of incentives to rebuild or relocate, is addressed under proposition 16.

Quantitative analysis – NGO support.

Respondents from both case study sites were asked about the importance of the work of NGOs in their residential decision-making process. Table 21 displays the perceived importance of help from NGOs in the residential decision-making process. In general, NGOs appeared to have more perceived influence in Oakwood Beach than in Sea Bright. In Oakwood Beach, a majority of respondents (55.6%) indicated that NGOs had a somewhat to very important role in their residential decision-making process. In contrast, only 23.2% of Sea Bright respondents saw NGOs as somewhat to very important in that process.

Table 21: Univariate Distribution of the Perceived Importance of Help From NGOs in the Residential Decision-Making Process

	<i>Buyout</i> <i>Oakwood Beach, NY</i>		<i>Comparison</i> <i>Sea Bright Borough, NJ</i>	
	n	%	n	%
<i>Help from other organizations (such as a local church or civic group)</i>				
<i>Not Important At All</i>	13	24.1	131	43.2
<i>Not Very Important</i>	7	13	68	22.4
<i>Somewhat Important</i>	11	20.4	43	14.2
<i>Very Important</i>	19	35.2	28	9.2
<i>Total</i>	50	92.6	270	89.1
<i>Missing</i>	4	7.4	33	10.9

When looking at the sample from Sea Bright, the perceived importance of NGOs was significantly related to Same Community and Same Address. The phi score suggests that the relationship is moderate. Analysis of crosstabs shows that Sea Bright respondents that rated help from NGOs as important were more likely to have moved than respondents that rated help from NGOs as less important. There is no significant relationship between the perceived importance of NGOs and Same Community or Same Address for respondents from Oakwood Beach. When looking at Buyout Decision for Oakwood Beach, however, the relationship is significant and relatively strong. The tau score suggests that by knowing how important a resident from Oakwood Beach ranks the role of NGOs in the residential decision-making process gives a 28.4% better chance or accurately predicting whether a resident accepted a buyout offer. Analysis of crosstabs shows that Oakwood Beach respondents that rated

help from NGOs as important were more likely to have accepted a buyout offer than respondents that rated help from NGOs as less important.

Table 22: Bivariate Analysis of the Importance of Help from Non-Governmental Organizations

**54. Help from other organizations (such as a local church or civic group)
(Not Important at all (1) to Very Important (4))**

	Significant Relationship (P-value)	Relative Strength*	Proportional Reduction of Error (PRE) Percentage**
<i>Same Community (0,1)</i>			
<i>Oakwood</i>	-	-	-
<i>Sea Bright</i>	0.01	Moderate*	Tau (4.2%)*
<i>Same Address (0,1)</i>			
<i>Oakwood</i>	-	-	-
<i>Sea Bright</i>	0.00	Moderate**	Tau (4.5%)**
<i>Buyout Decision (0,1)</i>			
<i>Oakwood</i>	0.02	Relatively Strong*	Tau (28.4%)*
<i>Sea Bright</i>	-	-	-

* $p \leq 0.05$. ** $p < 0.01$, *** $p < 0.001$

relative strength based on Phi or Cramer's V score.

PRE test chosen based on type of variables tested.

Missing values indicates the relationship was not significant.

Quantitative analysis – affordable housing.

Since the literature notes that the availability and affordability of appropriate housing is an important element of any relocation or resettlement effort, respondents were asked how important access to affordable housing was in their residential decision-making process. In total, respondents from Oakwood Beach indicated that affordable housing was a more important issue than respondents from Sea Bright indicated when deciding where to live after Hurricane Sandy. Approximately 63% of Oakwood Beach residents reported that affordable housing was somewhat to very

important in their residential decision-making process, compared to only 37% of Sea Bright residents.

Seeing that affordable housing is closely related to concerns about going into debt, this was also evaluated when considering this proposition. Table 23 displays the univariate distribution for both the perceived importance of access to affordable housing and concerns about going into debt. As would be expected in light of the previous inquiry, concerns about going into debt were more important overall for respondents from Oakwood Beach than they were for their counterparts from Sea Bright. Approximately 76% of Oakwood Beach respondents rated concerns about going into debt as somewhat to very important in their decision-making process, compared to only 48% of Sea Bright respondents.

Table 23: Univariate Distribution of the Perceived Importance of Access to Affordable Housing and Going Into Debt in the Residential Decision-Making Process

	<i>Buyout</i> <i>Oakwood Beach, NY</i>		<i>Comparison</i> <i>Sea Bright Borough, NJ</i>	
	n	%	n	%
<i>Access to affordable housing</i>				
<i>Not Important At All</i>	13	24.1	102	33.7
<i>Not Very Important</i>	4	7.4	59	19.5
<i>Somewhat Important</i>	13	24.1	64	21.1
<i>Very Important</i>	21	38.9	48	15.8
<i>Total</i>	51	94.4	273	90.1
<i>Missing</i>	3	5.6	30	9.9
<i>Concerns about going into debt</i>				
<i>Not Important At All</i>	5	9.3	73	24.1
<i>Not Very Important</i>	4	7.4	59	19.5
<i>Somewhat Important</i>	17	31.5	75	24.8
<i>Very Important</i>	24	44.4	69	22.8

<i>Total</i>	50	92.6	276	91.1
<i>Missing</i>	4	7.4	27	8.9

The perceived importance of access to affordable housing was only significantly related to Same Address for the Sea Bright sample. The phi score suggests a moderate association and the tau score indicates that knowing the rank importance given to affordable housing increases the likelihood of predicting if a respondent lives at the same address by 9%. Analysis of crosstabs suggests that respondents that were more concerned about affordable housing were more likely to move than respondents that rated affordable housing as less important. Concerns about going into debt returned similar results. This variable was also only significantly related to Same Address for the Sea Bright sample, and the association was weak.

Quantitative analysis – incentives.

Both the states of New York and New Jersey used incentives to try to influence residential decision-making following Hurricane Sandy. While buyouts have been offered in a limited capacity following past disasters (see Fraser *et al.* 2003), there is little known about the effects of both incentives to relocate and incentives to rebuild in situ on household residential decision-making in the wake of disaster. The questionnaire asked respondents to indicate how important both incentives to relocate and incentives to rebuild in situ were in their household decision-making process. Table 24 displays the perceived importance of each of these incentives. Although the questionnaire already probed buyouts and they were discussed under proposition two,

this question allowed respondents to expand upon this, noting not only their decision but also the perceived importance of the aid in their decision-making process.

Respondents from Oakwood, in general, were polarized on the issue of incentives to rebuild in situ. Approximately 40% reported that financial incentives to rebuild in situ were not important at all in the residential decision-making process, while 26% reported that they were very important. The numbers do not vary substantially between the two sites on this issue. In Sea Bright, 36% of respondents reported that incentives to rebuild in situ were not important at all, while only 21% suggested they were very important. There is a relatively larger difference between the two sites, however, when considering financial incentives to relocate. In Oakwood Beach, 46% of respondents stated that incentives to relocate were either not very important or not important at all in their residential decision-making process, compared to 67% of respondents from Sea Bright.

Table 24: Univariate Distribution of the Perceived Importance of Financial Incentives in the Residential Decision-Making Process

	<i>Buyout</i> <i>Oakwood Beach, NY</i>		<i>Comparison</i> <i>Sea Bright Borough, NJ</i>	
	n	%	n	%
<i>Financial incentives to rebuild your home in the same community from the government (aid programs)</i>				
<i>Not Important At All</i>	22	40.7	106	35.0
<i>Not Very Important</i>	8	14.8	38	12.5
<i>Somewhat Important</i>	6	11.1	64	21.1
<i>Very Important</i>	14	25.9	63	20.8
<i>Total</i>	50	92.6	271	89.4
<i>Missing</i>	4	7.4	32	10.6
<i>Financial incentives to build your home in a new location from the government (aid programs)</i>				
<i>Not Important At All</i>	19	35.2	152	50.2
<i>Not Very Important</i>	6	11.1	52	17.2
<i>Somewhat Important</i>	7	13	38	12.5
<i>Very Important</i>	19	35.2	27	8.9
<i>Total</i>	51	94.4	269	88.8
<i>Missing</i>	3	5.6	34	11.2

Table 25 displays an overview of the bivariate analysis of the importance of incentives to rebuild in situ. Same Community, Same Address, and Investment were all significantly related to incentives to rebuild in situ for the Oakwood Beach sample. For both Same Community and Same Address, the phi score shows that the relationship between the variables is relatively strong. When considering Investment, the gamma score suggests that by knowing the rank score given by a respondent to the importance of incentives to rebuild in situ, the odds of correctly predicting their Investment rank increases by 37%. Analysis of crosstabs unsurprisingly indicates that

respondents that suggested that incentives to rebuild as important were more likely to live in the same community, at the same address, and show higher levels of Investment than respondents that suggested incentives to rebuild were not important. The only significant relationship for the Sea Bright sample, Same Address, was a weak relationship. It is important to note that there were no significant relationships between incentives to relocate and the residential decision-making for either sample.

Table 25: Bivariate Analysis of the Importance of Incentives to Rebuild In Situ

52. Financial incentives to rebuild your home in the same community from the government (aid programs)
(Not Important at all (1) to Very Important (4))

	Significant Relationship (P-value)	Relative Strength*	Proportional Reduction of Error (PRE) Percentage**
	<i>Same Community (0,1)</i>		
<i>Oakwood</i>	0.01	Relatively Strong**	Tau (22.7%)*
<i>Sea Bright</i>	-	-	-
	<i>Same Address (0,1)</i>		
<i>Oakwood</i>	0.04	Relatively Strong*	Tau (16.2%)*
<i>Sea Bright</i>	0.02	Weak*	Tau (3.8%)*
	<i>Investment (0,1,2,3,4)</i>		
<i>Oakwood</i>	0.02	-	Gamma (36.7%)*
<i>Sea Bright</i>	-	-	-

* $p \leq 0.05$. ** $p < 0.01$, *** $p < 0.001$
relative strength based on Phi or Cramer’s V score.
PRE test chosen based on type of variables tested.

Qualitative analysis – buyout offer – questionnaire data.

To avoid unnecessarily parsing the discussion and confusing the dialogue, incentives are covered under the preceding section related to policies, plans, and programs. Unsurprisingly, respondents were not talking about their income in regards to the best and worst things about their communities. When considering Process and

Pitfalls, people did discuss a lack of funds as an issue, and while income influences available funds, aid available and accessible wealth serve as a more honest measure. This is the same case in the interviews. I already discussed aid, and the convoluted process related to aid, under the “policies and plans” heading above. No questions directly measured accessible wealth, but a portion of Sea Bright respondents and interviewees noted that they felt their ability to use their own funds instead of waiting for insurance or aid ultimately sped up their housing recovery process.

When describing the best and worst pieces of their community, respondents did not mention the buyout program. A number of respondents from Oakwood Beach, however, wrote about the buyout program when describing their own experiences during housing recovery and the problems and pitfalls encountered during that process. A portion of respondents described the buyout as a fairly straight-forward, three-step process of working with local community leaders, filling an application to the state, and receiving a buyout offer from the state between 11 and 16 months after the storm, as typified by the quote “...the NY state buyout was clear cut and expeditious”.

Additional respondents, however, noted issues associated with the offers. One respondent called the process “a joke” and stated that it took multiple follow-ups to actually receive the offer and move. A few others noted changes in the housing market post-Sandy made the buyout offer insufficient to purchase replacement-level housing, while another respondent stated that their “dream of paying off their mortgage of their former house before retirement” was gone due to expenses incurred in the moving

process, even with the buyout. Another respondent noted that, even though the buyout offer was not compulsory, they did not feel they had a choice, mentioning that "...in the end we were compelled to take the state's offer to buy our property".

Renters described a different experience with the buyout program when compared to homeowners. A few respondents that rented their properties noted their lack of involvement in the process. One was even surprised by an eviction notice in the form of buyout acceptance, noting "...out of the blue I was notified that my landlord accepted the buyout and I had 90 days to move." A second renter noted that, after the property owner told them they had to move, they had a difficult time finding another rental, presumably due to the inflated rent prices and preponderance of new renters displaced by Hurricane Sandy.

A final contingent of responses came from households that lived in Oakwood Beach as defined for the study that were not eligible for the buyout program. The previous section on risk perception highlighted the experience of one household in this situation, noting the fear associated with their exposure to hazards. Another resident noted that they were still waiting for an offer, describing their area as "...completely unsafe from tidal surges and hurricanes". It was apparent that a number of respondents were interested in the buyout program, but did not fall within the buyout area. One respondent noted that "We fell short just 50ft from the buyout. The Buyout is considered offered to Oakwood Beach." Respondents went to great lengths to indicate that they wanted buyouts, including one respondent writing on every page of the questionnaire "WE NEED A BUYOUT". Other quotes made it clear that some

respondents did not understand why New York State offered some areas buyouts and did not offer a similar program in other areas. Unfortunately, studies like this may emphasize and exacerbate some of that confusion, as noted in the following quote:

The politicians told us we were in Oakwood and not Oakwood Beach. In the meantime we receive these surveys we fill out stating Oakwood Beach. This is the problem and pitfall unfortunately for my family.

Interviews – buyout offer.

The state of New York did not offer any of the interviewees from Oakwood Beach a buyout. One interviewee participated in a failed effort to solicit a buyout, a second signed an unrelated petition for a buyout, and the third rented a home that the state purchased through the buyout program, but did not directly participate in the buyout process. There were two consistencies across this set of interviews. First, each of households that participated in the interviews showed interest, to varying degrees, in the buyout program.

And um, my children have um, lost one of their friends who was a 20 year old, and his father and another one of their friend's fathers. I did not plan on going back at all. That was it for me. And then once he [the landlord] had the buyout, we left with what we could salvage and he cleaned out the house and gutted the house out and he offered but we definitely let him know we weren't interested in returning. We haven't heard anything about the buyout, you know, what happened with him. We just pretty much left it with we weren't returning either way.

Second, like noted in the Process and Pitfalls section, no one had a clear idea of how the state chose the properties it purchased. The interviewees often mentioned the failed buyout effort following the 1992 Nor'easter and the damage the houses underwent

below Hylan Boulevard. Each interviewee also mentioned, however, that some of the properties chosen and not chosen as eligible for a buyout appeared arbitrary.

Even someone I know, whose neighbor got bought out lived on the corner, but these people were farther up the street on the same side and weren't bought out. Again, this is word of mouth. These are the kind of things I've heard, but that was further up. Not to say it was nowhere near the beach, but they weren't a block away from the beach like we were. They were separated by... it's actually called Mill Road. And their houses out there, maybe the water went up another four or five blocks from my area. And a lot of those houses though were built there all higher houses with steps, that would be like eight or twelve feet up, where my house and the houses in my little three block community were 95% bungalows or on the ground.

Since the state of New Jersey did not offer residents of Sea Bright a buyout, I described the program in New York for interviewees, and asked them if they would have been interested in taking advantage of a similar program after Sandy. Responses to this question were mixed, falling into three identifiable attitudinal archetypes. The first group was not interested in a buyout, often citing a deep, historical connection to the area, or to their neighbors, noting that they would not move away from them.

No. It's just a different [pause] I'm not one of them but a lot of people in Sea Bright are fourth-generation, um, grew up here and it's not the buildings and it's not necessarily the ocean or the river, it's the people. We can't bring... We can say that alright let's go somewhere else, let's all go and take 1500 people and go somewhere. But that's not going to happen. So there may not be, I don't know this other place, but there may not be that sense of community that we have here.

A second group of interviewees showed what I interpreted as surprise over the existence of such a program and eventually envy at the prospect of a similar buyout program. Many interviewees asked me numerous follow-up questions regarding the

mechanics of such a program, eventually stating, after a number of long pauses, that they would be interested in a program like this for their area.

[S1]: If the finances were right, I think so.

[S2]: So, pre-Sandy, but before the crash or after the crash?

[I1]: After the crash. It's still so, for the area...

[S1]: It would still work...

[S2]: Yeah, but that's an option. And that's a good option.

[I1]: Yeah.

[S2]: Not that we would have done it, but at least it's an option to think about. I'm not saying that we wouldn't have done it either.

[S1]: I'd still do it at this point. I think...

[S2]: It's a...

[S1]: But nobody came to me and said "here we will pay you this," so that it covered what I owe on my home. I think I would definitely...

[S2]: I think I would do that too.

[S1]: Just because of what we've been through in the past year and a half. I can't keep doing it. I'd be more than happy to pay off that current mortgage that we have and take my insurance money and if SBA would give us a loan, just go somewhere else.

[S2]: Yeah, that might be easier. Yeah.

Other interviewees took more of a middle-path, recommending that what may be good for the individual might not be good for the community. While they understood that individuals might benefit from a buyout, they saw this as a threat to their place identity, and feared how the loss of members would change their community.

[S1]: I think people would've...some people would've probably made out very well by doing that um, as a whole though I wouldn't want to see that happen. You know um, it's a matter of individual versus the town, you know, for certain people, yes. You know, if they had to abandon or they had to walk away from their mortgages or whatever and then somebody said "Let me buy the house" then yes. You know on a personal level I would like to see that but on a broader level for the town I wouldn't want to see streets brought up by developer I just... I wouldn't want to see that.

In an exemplary comment that emphasizes anxiety over change, one interviewee called Sandy "storm-assisted imminent domain for the rich". She went on to explain

that the community changed after the storm, where lower to middle income families could not afford to rebuild, and were forced to sell to the rich, who would only use the property as a second home, which she felt defiled the identity of Sea Bright.

Qualitative analysis – NGO support – questionnaire data.

Since the questionnaire asked respondents to indicate the best and worst parts of their community, they rarely mentioned organizations, especially NGOs, in this section. When discussing the Process and Pitfalls, however, respondents from both sites discussed the work of emergent groups, established NGOs, businesses, and individuals as critical in their housing recovery effort. Many respondents from Oakwood Beach mentioned the work of Guyon Rescue, a NGO founded on November 2, 2012, following Hurricane Sandy to meet the needs of residents affected on Staten Island. Respondents emphasized the importance of the group, noting that they brought food and home supplies, while also acknowledging that this group stayed and helped well after many other groups left.

Sea Bright respondents often cited Sea Bright Rising, an emergent group created in the wake of Hurricane Sandy to respond to the needs of Sea Bright residents, as helping with a number of needs during the recovery effort. Respondents noted that the group helped with rent, security deposits, even recounting that the organization “gave us gifts for Christmas for my Grandson”. Respondents from Sea Bright also mentioned rental and mortgage assistance from Catholic Charities, which was a recurrent, often unmet need mentioned by respondents.

A number of respondents mentioned businesses and individuals, both from within and outside the community, who contributed to their housing recovery effort. Notably, within Sea Bright, respondents mentioned Woody's, a local restaurant, as supplying meals to individuals in the area. A few individuals also described the work of the National Guard as "wonderful", noting that they helped households remove furniture and clean out damage. Respondents from both sites also mentioned the work of individuals, from both within and outside the communities, bringing clothing, blankets, food, coffee, and assisting them with cleaning out basements and removing dry wall and debris.

There was a detectable undercurrent of complaints regarding the work of NGOs in the area, often tied to not meeting the expectations of the people. One respondent stated that the

RED CROSS was absolutely, shockingly unhelpful. After days of waiting, we received one pail, one half gallon of bleach, gloves, a sponge and ONE self-contained meal - unbelievable!

Another resident mentioned that when they contacted the Red Cross to try to receive rental assistance, the Red Cross suggested they call back when they were in their home and the organization would help them with furniture. The resident went on to argue that this was no help, because that was not the immediate need. Other respondents, however, noted that the Red Cross did help meet some of their needs, but many of these respondents also mentioned a continuing need for rental assistance.

Interviews – NGO support.

Interviewees from both case study communities mentioned the role of NGOs in their housing recovery. While they did not specify that NGOs had a major role in their decision-making process, they did suggest that they had a positive influence on their housing recovery process.

Um, well, you know, there was a lot of help the first few days down here, it was unbelievable because the government wasn't doing anything.... We had outsiders coming in, like good Samaritans, people coming from other states that actually loaded up their SUVs or they came with little trailers full of supplies, food and toiletries, and clothing and they were out in, you know, parked around here in the streets and just giving stuff away, what you needed, and barbeque grills were set up and that's how we ate and the VFW Post that was hit hard, they set up an operation there called Guyon Rescue, and again, good Samaritans, they fed us. We came from our friend's house early in the morning, and we stayed here until it got dark and it got cold, and we would go there and grab something to eat, they would give us breakfast, lunch and dinner... You had like Moe's and fast food restaurants come and then drop stuff off, and then the guys and gals were cooking for you.

As it was with the Process and Pitfalls questions, interviewees from Oakwood Beach mentioned the work of Guyon Rescue more than any other NGO in the area. They suggested that the government responded slowly to the area, leaving two days where they did not see government personnel in the area offering assistance. What they did see, however, was the presence of local relief. Guyon Rescue emerged, local individuals brought in supplies from less-affected areas, and local restaurants fed residents and local volunteers.

In Sea Bright, a number of interviewees mentioned a similar occurrence. They often highlighted the work of Sea Bright Rising as a significant contributor of supplies and aid. Many also mentioned the work of the band Train, who held a benefit concert

for the town. Interviewees also credited Benjamin Moore, by painting the downtown area and contributing a mural, with improving the aesthetics of downtown, citing it as a moment that restored a portion of the beauty the storm had taken. As with Oakwood Beach, interviewees also mentioned that they had “more quality food than they could eat for free” from local restaurants, often noting that Sandy also damaged the restaurants.

I think reducing FEMA’s complicacy level could have been really helpful. For a lot of people, it wasn’t helpful. You know, we were very fortunate to have the non-profit Sea Bright Rising come forward. There were a lot of non-profits that popped up after Sandy, you know like Clean Ocean Action, there were a lot of other existing non-profits that, it was very much like, “Well what are you doing for Sandy?” So a lot of different non-profits kind of filled that role.

It is interesting that often people noted the role of NGOs in contrast to the role of government. While interviewees in Oakwood Beach suggested it was a time gap NGOs filled, interviewees in Sea Bright tended to imply that NGOs satisfied a long-term needs gap that the government could not meet.

Qualitative analysis – affordable housing – questionnaire data.

While there was not a relatively large amount of discussion surrounding housing or debt in Pre- and Post-Best and Worst, a limited number of respondents did bring up a few issues. A number of issues related to housing were mentioned, but many of the response categories had less than five respondents from either site. Surprisingly, the only response category with a relatively sizeable amount of responses was related to post-Sandy improved housing. In Oakwood Beach, 10 respondents mentioned that their new housing was actually more desirable than their

previous housing, compared to 15 respondents from Sea Bright indicating the same.

While none of these categories had more than 10 responses, respondents also mentioned that they enjoyed affordable housing before Sandy,

Of course, when addressing problems and pitfalls encountered in the housing recovery process, many respondents simply acknowledged that organizations denied their aid applications, often not understanding why. If not denied, many noted that they did not think the aid they received was adequate to recover. While many acknowledged that the rate offered by the SBA on loans was excellent, they often lamented the idea of taking on additional debt in an uncertain time. Respondents even mentioned that the aid was critical in their decision-making process. Some noted that a lack of aid made it impossible to repair their homes, while others felt they had to repair to regain adequate value in their homes to sell it.

Now my biggest problem is selling my house, especially when the newspapers and news keep reminding everyone about the horrors of the storm. I probably will not get a decent price for my house. The first question people ask is "How much water did you get?"

As noted by the following respondent, however, mitigation on their existing home is a perceived necessity to sell and be able to leave the area, and the grants are a necessary, enabling factor.

We followed all instructions for the housing rebuilding and elevation grants. We only received a grant from the state to stay in Monmouth County for three years. The paperwork has been a nightmare. There has been very little help from the federal or state governments to help us with the elevation grants. I believe I may not get the grants to elevate which in turn would make us unable to sell the house in the future.

To complicate an already tenuous situation, respondents were not sure what their flood insurance premiums would rise to under the Biggert-Waters Act, and if the associated changes to the flood maps would require them to elevate their homes after Sandy.

FEMA requirement to raise building made recovery impossible financially. We could have fixed, but no bank on the planet would have given future buyer a mortgage. Any money to repair would have been for naught.

A number of respondents found themselves in a situation where they were either paying rent or receiving aid to pay for an apartment or hotel (more in the short term) while still paying for their mortgage. Often, they noted that they were living month-to-month, not knowing if they would receive aid to help with their rent or if they would have to find somewhere else to live until their home was repaired. Many did not have the option, however, of signing a month-to-month lease after hotels were no longer feasible. Many described being in a position where they did not want to sign a long-term lease on an apartment because they did not know how long they would be displaced, but had to so they could acquire a reasonable rate.

Interviews – affordable housing.

A number of interviewees echoed this feeling of having legitimate concerns about where they live that emerged from the Process and Pitfalls questions, but that they did not feel they had the ability to decide where they lived. Interviewees from both sites noted that the financial realities that existed in the wake of Sandy created a situation where, even if they felt strongly that other factors (like risk, for example) should dictate where they live, the decision was not their own. Interviewees suggested

that they either could not afford to move due to financial constraints, both pre-existing or imposed by Sandy, or that even if they desired a move they could not, due to current state of the housing market.

This really highlights the multifaceted nature of such a complex decision-making process. As outlined in the quote below, while the desirability of the setting had declined (place dependence) and the risk was apparent (living on a sand bar), the interviewee resorted to their retirement or safety-net savings to pay for housing repairs, and felt this would force them to sell once the local housing market rebounded.

Yes I was thinking about it because I'm 64, I'll be 65 next month, it's really not a good place to retire to. You know, it's out there on a little sandbar, it's out there it's not too practical for me. So I thought, you know it was probably time for me to move inland and find something smaller. Some apartment or townhouse that was small.

[I]: So you were just thinking about moving because you wanted to retire and your house wasn't so practical for you anymore?

[S]: Correct.

[I]: And now you're thinking about it again once you're home with this value back or?

[S]: Well I have to really. I want to plug the hole in my retirement savings. Had I known roughly two years ago what I know now, I would have knocked the house flat and sold the land. A huge waste of my money, unless I can sell this house at a price that reflects everything that I just put into it.

[I]: Right. So you...

[S]: So I took the risk. I mean I really wish I could have just knocked it flat...

This was not a unique situation. A number of interviewees noted that they tapped into reserves to repair their homes following Sandy. While they may have intended to relocate due to other factors, they could no longer afford a down payment on a new

home, and walking away from their damaged home would be a financial loss they could not fathom.

[I]: Can you talk me through what made you want to stay, what process was there? When you decided?

[S1]: Money.

[I1]: Money?

[S1]: It was money. We couldn't sell it and walk away with anything and even our insurance money wouldn't cover the cost, meaning insurance paid us "X", let's sell our house for this, add it all together and we're still in the hole. So we couldn't walk away with being in a hole like that and try to go somewhere else and start a home.

Situations such as the one described above emphasize the importance of a longer-term perspective of this decision-making process. A predominant theme in the interviews, and in the Reside plan variable, was that a significant portion of the study participants did not plan to live at their current residence for an extended period following Sandy.

In the interviews, as highlighted by the quote above, they described factors the literature identified as drivers for relocation and resettlement as important, even central, in their decision-making process, but also indicated that this is not a phenomenon that can be understood fully through cross-sectional analysis.

Well, if you're going to move, you still have to rebuild your house. You can't walk away from it because you've got a mortgage, so most of the people that live here don't have a choice. I mean, if I went and moved somewhere else, now I'm carrying two mortgages and I have a property that I'm rebuilding. That property, to be honest with you, the market was non-existent for Sea Bright for the first year, except for those individuals who were opportunistic and thought they could buy a property really cheap. Because there could be somebody here whose grandfather left their bungalow to the hierarchy in the family, and eventually somebody who doesn't have flood insurance might just walk away from it. Maybe somebody that's an opportunist might come in and say they'd want to buy that. Nobody was buying in Sea Bright in 2013. So, you know, how do you move? What do you do with the house that is sitting here in need of repair that nobody is going to buy, because the town still in 2013, there

was no businesses here, there was nothing here. We're just starting now to see signs of life. Restaurants are beginning to open and retailers are coming back, but there was a good year, year and a half where nobody was going to buy a house in this town.

Impacts

Proposition 5 - The level of damage to the physical environment may affect household residential decision-making.

H₀: There is no relationship between the level of damage to the physical environment and household residential decision-making.

H₁: There is a relationship between the level of damage to the physical environment and household residential decision-making.

Proposition 3 – Relocation and resettlement may result in increased levels of stress for household members.

H₀: There is no relationship between relocation, resettlement, and increased levels of stress.

H₁: There is a relationship between levels of stress and household residential decision-making.

Proposition 14 - The process and both positive and negative events from the moment of displacement to the beginning of resettlement may affect household residential decision-making.

H₀: There is no relationship between the process and both positive and negative events from the moment of displacement to the beginning of resettlement and household residential decision-making.

H₁: There is a relationship between the process and both positive and negative events from the moment of displacement to the beginning of resettlement and household residential decision-making.

Quantitative analysis – damage and disruption.

As detailed in the case study descriptions, Hurricane Sandy caused extensive damage to both communities. The questionnaire asked residents to detail damage to their home, their community, and travel disruption resulting from Hurricane Sandy. Table 26 details the damage and disruption reported for each study site. The average damage to their home reported by residents of Oakwood Beach was \$66,744.38 and

\$92,639.53 for residents of Sea Bright. Flood insurance coverage was almost identical for both sites, but the average payout by flood insurance varied dramatically. In Oakwood Beach, 76% of respondents indicated that they carried an active flood insurance plan, and the average payout was approximately \$35,507.76. In Sea Bright, 72% of respondents indicated that they carried an active flood insurance plan, but the average payout, at \$52,742.00 was much higher than Oakwood Beach.

A majority of respondents in both communities felt that damage to both their homes and their communities was extensive. When asked how they would assess damage to their own homes, 41% of Oakwood Beach residents said their damage was “very extensive”, compared to 31% of Sea Bright residents. Interestingly, 83% of Oakwood Beach residents rated damage to their community as very extensive, compared to 91% of Sea Bright residents. On the other end, only 19% of Oakwood Beach residents reported “not very extensive” to “no damage” to their homes, compared to 31% of Sea Bright residents. Again, the findings reverse when discussing damage to their community, where 9% of Oakwood residents reported “not very extensive” to “no damage”, compared to only 1% of Sea Bright residents.

When asked about travel disruption within Sea Bright, 86% of respondents indicated that Hurricane Sandy did disrupt their travel, and 17% suggested that this disruption lasted seven or more months. In Oakwood beach, 76% of respondents stated that Hurricane Sandy disrupted their travel within Oakwood Beach, while only 6% suggested that this disruption lasted seven or more months. On average,

respondents indicated that Hurricane Sandy disrupted travel within their community for two to four weeks at both sites.

Respondents indicated that traveling outside of their community, while it presented its own issues, was not as much of a problem, and not for as long as travel within the community was. Only 41% of Oakwood Beach residents indicated that travel outside of their community was an issue, compared to 54% of Sea Bright residents. The length of outside travel disruption was also shorter, in general, than travel within the communities. While the average for each site was the same as the internal travel disruptions, only 2% of Oakwood Beach residents indicated their travel disruption outside of their community lasted seven or more months, compared to 6% of Sea Bright residents.

As a part of a panel of questions designed to gain insights on the residential decision-making process, residents were also asked how important they felt their ability to easily travel within their community was in their post-Hurricane Sandy residential decision-making process. Respondents from Sea Bright, on average, suggested that their ability to travel within their community was more important in their decision-making process than Oakwood Beach respondents were. Only 39% of Oakwood Beach respondents indicated that the ability to travel within Oakwood Beach was somewhat to very important in their decision-making process, compared to 62% of Sea Bright respondents. When considering travel outside their community, 46% of Oakwood Beach respondents indicated that the ability to travel outside of

Oakwood Beach was somewhat to very important in their decision-making process, compared to 59% of Sea Bright respondents.

Table 26: Reported Damage to Home, Community, and Disruption to Travel

	<i>Buyout</i> <i>Oakwood Beach, NY</i>		<i>Comparison</i> <i>Sea Bright Borough, NJ</i>	
	n	%	n	%
<i>How extensive was the damage to your home due to Hurricane Sandy?</i>				
<i>No Damage</i>	3	5.6	20	6.6
<i>Not Very Extensive</i>	7	13	73	24.1
<i>Somewhat Extensive</i>	22	40.7	113	37.3
<i>Very Extensive</i>	22	40.7	93	30.7
<i>Total</i>	54	100	299	98.7
<i>Missing</i>	-	-	4	1.3
<i>How extensive was the damage to [Oakwood Beach/Sea Bright] due to Hurricane Sandy?</i>				
<i>No Damage</i>	3	5.6	-	-
<i>Not Very Extensive</i>	2	3.7	3	1.0
<i>Somewhat Extensive</i>	3	5.6	10	3.3
<i>Very Extensive</i>	45	83.3	276	91.1
<i>Total</i>	53	98.1	289	95.4
<i>Missing</i>	1	1.9	14	4.6
<i>Travel disruption</i>				
<i>At any time did the disruption from Hurricane Sandy affect your ability to travel within [Oakwood Beach/Sea Bright] for everyday activities (go to work, church, the post office, the grocery store, etc.)?</i>				
<i>No</i>	12	22.2	30	9.9
<i>Yes</i>	41	75.9	260	85.8
<i>Total</i>	53	98.1	290	95.7
<i>Missing</i>	1	1.9	13	4.3
<i>How long did the disruption from Hurricane Sandy affect your ability to travel within [Oakwood Beach/Sea Bright] for everyday activities (go to work, church, the post office, the grocery store, etc.)?</i>				
<i>Less than a week</i>	6	11.1	2	0.7
<i>Two to four weeks</i>	21	38.9	97	32.0
<i>Two to six months</i>	11	20.4	105	34.7
<i>Seven to twelve months</i>	2	3.7	31	10.2

<i>More than a year</i>	1	1.9	20	6.6
<i>Total</i>	41	75.9	255	84.2
<i>Skipped</i>	12	22.2	30	9.9
<i>Missing</i>	1	1.9	18	5.9
<i>Did the disruption from Hurricane Sandy affect your ability to travel outside [Oakwood Beach/Sea Bright] at any time?</i>				
<i>No</i>	22	40.7	162	53.5
<i>Yes</i>	32	59.3	126	41.6
<i>Total</i>	54	100	288	95.0
<i>Missing</i>	-	-	15	5.0
<i>How long did the disruption from Hurricane Sandy inhibit your ability to travel outside [Oakwood Beach/Sea Bright]?</i>				
<i>Less than a week</i>	4	7.4	25	8.3
<i>Two to four weeks</i>	18	33.3	44	14.5
<i>Two to six months</i>	9	16.7	40	13.2
<i>Seven to twelve months</i>	1	1.9	15	5.0
<i>More than a year</i>	-	-	4	1.3
<i>Total</i>	32	59.3	128	42.2
<i>Skipped</i>	22	40.7	162	53.5
<i>Missing</i>	-	-	13	4.3
<i>Ability to travel easily within [Oakwood Beach/Sea Bright]</i>				
<i>Not Important At All</i>	18	33.3	43	14.2
<i>Not Very Important</i>	12	22.2	44	14.5
<i>Somewhat Important</i>	9	16.7	114	37.6
<i>Very Important</i>	12	22.2	74	24.4
<i>Total</i>	51	94.4	275	90.8
<i>Missing</i>	3	5.6	28	9.2
<i>Ability to travel easily outside of [Oakwood Beach/Sea Bright]</i>				
<i>Not Important At All</i>	12	22.2	49	16.2
<i>Not Very Important</i>	13	24.1	46	15.2
<i>Somewhat Important</i>	13	24.1	95	31.4
<i>Very Important</i>	12	22.2	84	27.7
<i>Total</i>	50	92.6	274	90.4
<i>Missing</i>	4	7.4	29	9.6

When exploring the role of damage in the residential decision-making process, a few trends emerge. For the sample from Sea Bright, the extent to which Hurricane Sandy damaged their home was significantly related to whether they lived in the same community or at the same address. In both cases, the phi score indicated that this was a moderate relationship. Analysis of crosstabs indicates, as expected, that respondents with extensive damage were more likely to move than respondents with less than extensive damage were. Perception of damage to either home or community did not significantly relate to the dependent variables in the Oakwood Beach sample.

Table 27: Bivariate Analysis of Damage to Home

**24. How extensive was the damage to your home due to Hurricane Sandy?
(No damage (1) to Very Extensive (4))**

	Significant Relationship (P-value)	Relative Strength*	Proportional Reduction of Error (PRE) Percentage**
	<i>Same Community (0,1)</i>		
<i>Oakwood</i>	-	-	-
<i>Sea Bright</i>	0.00	Moderate***	Tau (3.1%)***
	<i>Same Address (0,1)</i>		
<i>Oakwood</i>	-	-	-
<i>Sea Bright</i>	0.00	Moderate***	Tau (3.4%)***

* $p \leq 0.05$. ** $p < 0.01$, *** $p < 0.001$

relative strength based on Phi or Cramer's V score.

PRE test chosen based on type of variables tested.

Missing values indicates the relationship was not significant.

The existence of disruption both within and outside of each community returned mixed results. The perceived existence of disruption within the community was only significantly related to Committed for the Oakwood Beach Sample. The phi value indicates that the relationship strength is moderate and, since it is a 2x2 table, gives a negative directionality, suggesting that individuals that relocated were more

likely to note the presence of disruption than individuals that rebuilt in situ. The perceived existence of disruption outside the community was significantly related to Same Address and Reside Plan for the sample from Sea Bright, with the phi scores indicating a weak and moderate association respectively. It is interesting to note, however, that the phi score for Same Address was positive, indicating that individuals that perceived disruption outside their community were more likely to have rebuilt.

When considering the perceived length of time Hurricane Sandy disrupted travel both within a community, there was a significant relationship for both Same Community and Same Address for the sample from Sea Bright, with the phi score indicating a moderate relationship for both variables. Table 27 displays the results of this test. Knowing the rank score for the perceived length of disruption outside Sea Bright gives a 10% better chance of correctly predicting whether a respondent from Sea Bright still lives in Sea Bright. The perceived length of disruption to travel outside a community was significantly related to Same Address and Reside Plan for the sample from Sea Bright, with the phi score returning moderate and weak associations respectively.

Table 28: Bivariate Analysis of Length of Disruption Within Community

27. How long did the disruption from Hurricane Sandy affect your ability to travel within [community name] for everyday activities (go to work, church, the post office, the grocery store, etc.)? (Less than a week (1) to More than a year (5))

	Significant Relationship (P-value)	Relative Strength*	Proportional Reduction of Error (PRE) Percentage**
<i>Same Community (0,1)</i>			
<i>Oakwood</i>	-	-	-
<i>Sea Bright</i>	0	Moderate***	Tau (10.0%)***
<i>Same Address (0,1)</i>			
<i>Oakwood</i>	-	-	-
<i>Sea Bright</i>	0.00	Moderate**	Tau (6.8%)**

* $p \leq 0.05$. ** $p < 0.01$, *** $p < 0.001$

relative strength based on Phi or Cramer's V score.

PRE test chosen based on type of variables tested.

Missing values indicates the relationship was not significant.

One of the interesting tests this study allowed was to see differences in the existence of disruption and the perceived importance of being able to travel within and outside of a community. While the existence of disruption was not statistically significantly related to any of the dependent variables for Oakwood Beach, the importance of travel within Oakwood Beach was, in many cases, critical in the decision-making process. Same Community and Same Address both were significantly related to the ability to travel within Oakwood Beach, and the phi scores indicate that both were relatively strong associations. This relationship was so strong that knowing the rank importance given to the ability to travel in Oakwood Beach increases the likelihood of positively predicting whether the respondent still lived in the same community by 19% and the same address by 20%. Analysis of crosstabs indicates that respondents that felt their ability to travel both within and outside their

community as important were more likely to live at the same address than respondents that did not rate this element of mobility as important.

Table 29: Bivariate Analysis of Ability to Travel Within Community

**50. Ability to travel easily within [community name]
(Not Important at all (1) to Very Important (4))**

	Significant Relationship (P-value)	Relative Strength*	Proportional Reduction of Error (PRE) Percentage**
<i>Same Community (0,1)</i>			
<i>Oakwood</i>	0.02	Relatively Strong***	Tau (19.2%)*
<i>Sea Bright</i>	-	-	-
<i>Same Address (0,1)</i>			
<i>Oakwood</i>	0.01	Relatively Strong*	Tau (21.9%)*
<i>Sea Bright</i>	0.02	Weak*	Tau (3.6%)*

* $p \leq 0.05$. ** $p < 0.01$, *** $p < 0.001$

relative strength based on Phi or Cramer’s V score.

PRE test chosen based on type of variables tested.

Missing values indicates the relationship was not significant.

Qualitative analysis – damage and disruption.

While individuals did not list “damage” in either of the Best or Worst sections, they did discuss missing pieces of their community. Even though this is an outcome of damage, this relates more to post-event functioning, since it relates to the state of the community, and perceivably is a result of it not being repaired at the time of the questionnaire. For that reason, this discussion occurs under proposition 14.

Respondents mentioned elements associated with disruption prominently, both in the Pre- and Post-Best sections. When considering Pre-Best, elements suggesting that traveling was favorable were noted since any pre-existing disruption noted should not be related to Hurricane Sandy. For Pre-Best, respondents from both sites often mentioned that the centrality of their community was one of the best things about it.

When discussing Pre-Best, respondents from Oakwood Beach listed “proximity to other places” (19) and “lack of traffic” (2). When looking at Post-Best, “proximity to other places” dropped (9), “public transportation” emerged (2), and “lack of traffic” disappeared. In Sea Bright, in contrast, “proximity to other places” (71) was one of the most-liked elements of their pre-Sandy community. Respondents also mentioned “walkability” (27) of the community and access to “public transportation” (6). Post-Best responses, however, see a dramatic drop across all of those responses. “Proximity to other places” drops by 13, “walkability” falls by 19, and public transportation falls to two.

Respondents from Oakwood Beach, when responding to Pre-Worst, did not focus on travel, only mentioning “traffic” (5). When responding to Post-Worst, traffic increased by one and “proximity to other places” emerged with nine respondents, suggesting some either felt that they were further away from necessities after the storm or that this became more important to them following the storm. Sea Bright respondents, interestingly, were both concerned and displeased with travel before Hurricane Sandy. For Pre-Worst, “traffic” (127), “parking” (15), and “proximity to other places” (14) were the top three responses. “Traffic” had the highest response total of any item in Pre-Worst, suggesting that traffic issues were a real concern for residents of Sea Bright. Interestingly, “parking” disappeared for Post-Worst and “traffic” dropped to 41, while “proximity to other places” rose to 58.

When discussing the Process and Pitfalls, responses associated with disruption centered on two related issues: disruption precipitating from a mandatory evacuation

and disruption caused by relocation. Following Hurricane Sandy, authorities restricted access to Sea Bright for approximately two weeks while authorities repaired gas leaks, and then instated a curfew that lasted until May 30, 2013, for the side streets within the town. Many residents noted that while they understood the purpose of this, they feared their inability to reach their homes exposed their homes to more damage due to sitting water. They also discussed the general anxiety induced by not being able to see their homes. The other issue discussed is the increased distance many respondents had to drive to reach their homes in the affected communities and to work after Hurricane Sandy displaced them. Respondents stated that many of them either lost their modes of transportation (a car for many, but others lost the train or ferry operation they relied on) but still needed to work, so a portion of respondents discussed their time in transit increasing by as much as two and a half hours each way.

Interviews – damage and disruption.

Every interviewee, when describing their experience with Sandy, detailed the damage to their community. When considering the role that destruction played in their residential decision-making process, a few themes materialized in the interviews. First, a number of interviewees in Sea Bright suggested that damage from the hurricane led to a number of shops and services never returning to the area, thus lowering their quality of life and taking away amenities that made their communities a desirable place to live.

And then of course after the storm there was nothing, there was a lot of devastation and now we have, some things are better and some things are worse. We don't have any services, we have plenty of restaurants and that sort

of thing, but we don't have any gas stations. We have sort of a storefront post office but not a real post office. I think I already mentioned the gas stations, we have no drycleaners, and we have no bank, although it looks like the bank may be coming back. We don't have any of the services that we used to have, so those are the things that are missing and it doesn't look like they're coming back, you know, with the exception of the bank. So um, you know we do have a grocery store, but it's not much of a grocery store. So some of the kind of essential services have been coming back, we do have a hardware store. It's the only store really. The rest are pretty much the restaurants, we have a liquor store and you know, a clothing store, but that's pretty much it.

This quote emphasizes a related point that was a larger theme between Sea Bright interviewees. While the damage precipitated losses within the community, interviewees often lamented the rate of recovery by the town. As noted in the attachment to place literature, interviewees grieved the loss of these local icons (most notably, the library), and wanted them to return to form as quickly as possible. When discussing disruption, interviewees often noted that their job was accommodating in light of what had happened, and that work offered them a sense of normalcy. Many interviewees noted that they had capabilities to work remotely once they found a location with electricity. As noted in the questionnaire, however, their commute often increased.

[I1]: It added another 45 minutes. Yeah, it was taking me close to three hours each way to get in and out cause I [laugh] well...

[I1]: Wow.

[S1]: You know, I had to keep my job.

[I1]: Mhm.

[I2]: Right. Yeah.

[S1]: You know, I had no choice so.

[I2]: Oh my gosh!

[I1]: How many times a week were you doing that?

[S1]: Five. [laughs]

[I1]: Five? Wow.

[S1]: Yeah, once I went back, I was back to work five days a week, yeah. I periodically would work at home for a day, but I really, basically was going in everyday

[I1]: Wow.

[I2]: I'm impressed, yeah.

[S1]: Listen, compared to what some people went through, it's nothing. Like seriously, seriously. I got home way faster than a lot of the people that I know and I know people that still aren't home, so I was lucky.

Qualitative analysis - stress - questionnaire data.

Explicit questions soliciting information regarding the mental health impacts of Hurricane Sandy were not a part of this study design due to space limitations.

Respondents, however, found room to discuss this in the Process and Pitfalls section.

When speaking of Sandy, Oakwood Beach respondents mentioned the three lives lost in the area due to the storm. They also discussed the stress induced by the buyout program.

Very stressful was process with mortgage company: show that you have enough money on your account, they don't trust the contract of Buyout Program "ReCreate NY" "ProSource" with written info which amount of money will be given to me. Eventually I am not happy because of all extra expenses which appeared because of moving out and in. My "dream" to pay off the mortgage of former house before retirement was gone and now my current house I will unable to pay off. On the top of everything, my marriage collapsed. It was too much for my husband.

Other respondents emphasized the impact of the hurricane on children. Respondents indicated that children suffered from Post-Traumatic Stress Disorder (PTSD) and behavioral issues. As noted in the comment above, marriages collapsed and other adult individuals mentioned that the storm and the recovery process led to long-term health issues, including feelings of dread, depression, hopelessness, and early onset of dementia. Many respondents just simply noted that the storm, and subsequent recovery

effort, had a permanent effect on their lives. Respondents indicated that the precarious situation of being between a rent and mortgage, not knowing if they would receive aid, and not being able to start repair affected their emotional health.

Bottom line – its been a mess from day one. All of it. I'm tired. My family living in a rental, our home sits rotting. The start of our project is no where [sic] in sight. I can't take another form to fill out or denial or having to prove we were victims of this storm. We run out of rental assistance Sept 1st and I am scared. We can't afford our rental, plus our mortgage, taxes, insurance, and bills.

Interviews – stress.

As with the Process and Pitfalls section, I was bewildered by how many times stress surfaced in the interviews. More times than not, when I asked people if there was anything else I did not ask that I should have, in both sites interviewees mentioned the stress induced by the storm and the recovery process. Paramount to the interviewees was the stress from the paperwork covered in previous sections, but people even described anxiety when seeing a piece of paperwork that mentioned the hurricane. Interviewees detailed doctors requiring them to take time off work and putting on prescriptions to handle the stress, waking up at night with their chest pounding, and children with problems in school requiring psychological testing.

I think I know how to explain, I feel like I've been... Three weeks ago, I went on disability. I went to the doctor because my hair was falling out. And as I'm in the office, I broke down and just kind of lost it, and they were like "I'm pulling you out" and I'm supposed to go back to work next week but it's just been three weeks of trying not to be an anxious, stressed mess. And I keep hoping my hair's going to grow back. But it does, it is affecting me and there's just been so much going on, I don't know. I mean if this storm piece wasn't a part of my life right now, I don't know where I'd be right now, meaning I wouldn't be at home hoping my insurance company covers my short term disability for the past three weeks. Which is something that has horrified me,

you know, I'm a professional, I've worked for over 25 years and for my doctor to say "I'm pulling you out" you know, you can't even speak, you're crying so hard, you know, it was like...

The quote below highlights a few additional dimensions that contributed to the stress induced by this hurricane and the continuing recovery effort. First, they acknowledged the stress induced by the hurricane itself, the tense evacuation many underwent, and the days of not knowing about the condition of your home, neighbors, or community. Second, a number of interviewees discussed the stress induced by displacement. They acknowledged that living in a new setting and not having access to their possessions added a dimension to the stress and served as a constant reminder of Sandy.

Oh it's very stressful. But you know, one stressor was not knowing because we were on the other side of the island and I was on the phone with my friend who stayed next door. We were on the phone and he was laughing at us because we lost power, and within two seconds I heard him screaming and yelling. He stayed at home with his wife and his one year old son and his five year old. They had to flee on foot, and once we heard that, we knew, we just knew that we were in serious trouble. Then watching the news, you know the stress of not knowing exactly how bad it was. And then not watching the news and not having any power and being stuck on the other side of the island not knowing what happened to our friends that lived down there. It's really stressful moving everything you own. It's very stressful. I had a breakdown just because I realized I don't even own a salt and pepper shaker, something as stupid as that. It's Thanksgiving, and I don't have my carving set, it's little moments like that. We still have moments where I think "Oh, I'm going to put on that shirt," and then saying, "Oh that was the old house, I don't have that anymore." So it's like living a little death every day. You know, when you realize, you know, we took pictures before we left for insurance purposes just in case. You know, trying to look back at everything we've lost. We just actually worked with the accountant and amended our taxes and it was like roughly \$95,000 of stuff that I've lost.

Qualitative analysis – post-Sandy experiences.

Post-Best and Worst offer unique insights on how households experienced their recovery, not necessarily by noting individual bad events but by noting negative outcomes, experiences, and changes from Pre- to Post-Worst. It is important to note, however, that an increase from Pre- to Post-Worst does not necessarily mean that the issue did not exist or was not important pre-Sandy. Rather, a change like this suggests that the issue gained more salience following the storm, and the concern outweighed other issues for respondents. Tables 30 and 31 represent Post-Best and Worst for both Oakwood Beach and Sea Bright respectively. Items represented in this table either had a large number of respondents indicating this was an issue or experienced a substantial shift from pre- to post-Sandy. Shifts in respondents are represented in parentheses on the table, and show changes in importance for those items. Negative numbers indicate that there were that many more responses in that category for the pre-Sandy period, and positive numbers indicate that the category gained that many responses post-Sandy. For Oakwood Beach, response categories were included if they either had a value of five or greater or the change in responses (delta) was five or greater. For Sea Bright, response categories were included if they either had a value of ten or greater or the delta was ten or greater. Responses were sorted by value.

Table 30: Changes in Post-Best and Worst for Oakwood Beach

Post-Best	n (Δ)	Post-Worst	n (Δ)
1. Hazard exposure	21 (+21)	1. Hazard exposure	9 (-20)
2. Improved housing	10 (+10)	2. Proximity to other places	9 (+9)
3. Neighbors	9 (-10)	3. Depopulation	5 (+5)
4. Proximity to other places	9 (-10)	4. Insects	5 (-6)
5. Quiet	7 (-18)	5. DEP station	0 (-9)
6. Isolated	5 (-5)	6. Pollution	0 (-5)
7. Close to beach	3 (-8)		
8. Security	2 (-8)		
9. Nature	0 (-6)		
10. Peaceful	0 (-6)		

While, as referenced earlier, it is possible and likely that post-Sandy experiences influenced responses to pre-Sandy questions, a number of the largest categories of responses experienced significant shifts in distribution in Oakwood Beach. For example, a number of respondents felt it was important that they experienced less hazard exposure and that their housing situation improved after Sandy. The amount of respondents mentioning characteristics of the environment related to the reticent nature of Oakwood Beach (“quiet”, “isolated”, and “peaceful”) and spatially sensitive variables, including “proximity to other places” and “neighbors”, dropped dramatically.

When looking at both responses to Post-Worst and shifts from Pre- to Post-Worst for Oakwood Beach respondents, three key concerns materialize. First, mirroring the previous section, less people thought their negative hazard exposure was a top-three concern in Post-Worst, compared to Pre-Worst. Second, less people mentioned environmental concerns, such as “insects”, “DEP station”, and “pollution”. Finally, similar to the previous section, more respondents mention “proximity to other places” as a concern and the “depopulation” of their community.

Table 31: Changes in Post-Best and Worst for Sea Bright

Post-Best	n (Δ)	Post-Worst	n (Δ)
1. Close to beach	121 (-80)	1. Slow recovery	60 (+60)
2. Proximity to other places	58 (-13)	2. Proximity to other places	58 (+44)
3. Attachment to place	32 (-3)	3. Local government	46 (+2)
4. Community	31 (-3)	4. Traffic	41 (-86)
5. Neighbors	31 (-20)	5. Loss of businesses	33 (+33)
6. Scenery	18 (-8)	6. Hazard exposure	29 (-25)
7. Small town feel	17 (-50)	7. Dilapidated	11 (-32)
8. Improved housing	15 (+15)	8. Increased expenses	10 (0)
9. Rebuilt businesses	14 (+14)	9. Lack of parking	8 (-42)
10. Close to friends	12 (+11)	10. Tourists	4 (-15)
11. Restaurants and bars	12 (-52)	11. Divisions in town	3 (-10)
12. New construction	10 (+10)	12. Police	2 (-10)
13. Downtown	8 (-39)	13. Loud	1 (-15)
14. Friendly	5 (-16)	14. Bars and drinking	0 (-14)
		15. Lack of downtown options	0 (-25)

In Sea Bright, Post-Best showed dramatic losses for a few concepts already discussed. For example, a number of responses related to attachment to place (“attachment to place”, “community”, “neighbors”, “small town feel”, and “friendly”) showed fewer responses than Pre-Best. Variables related to the proximity to other places showed mixed results, where “close to beach” and “proximity to other places” dropped, “close to friends” rose. Answers related to the physical environment showed

mixed results, with “scenery”, “restaurants and bars”, and “downtown” dropping, while “improved housing”, “rebuilt businesses”, and “new construction” all emerged as new categories.

In contrast, Post-Worst is a bit more scattered for Sea Bright respondents. One thing that is clear, however, is that the slow pace of recovery was prominent on the mind of respondents (“slow recovery” and “loss of businesses”). While issues with transportation (“traffic” and “lack of parking”) were still a major concern, they lost relative importance. Many of the other issues mirrored trends in Oakwood Beach. “Proximity to other places”, a related issue, gained relative importance. Concerns related to the physical infrastructure that existed prior to Sandy dropped (“dilapidated” and “lack of downtown options”). While the local government still presents issues for a number of residents, many other issues related to Sea Bright’s functioning like “tourists”, “police”, and “divisions in town” dropped in importance.

In previous sections, I discussed respondent’s experiences and assessments of the process, pitfalls, and problems encountered in the housing recovery process. In this section, I consider the experiences as a whole to tie those experiences together, detailing the steps in the process, paying special attention to the typical order of events in the recovery process for respondents in Sea Bright. Where possible, I note temporal dimensions of the experience. Unfortunately, I did not have a sufficient number of respondents from Oakwood Beach to have a similar discussion. While acknowledging that there was a wide range of variation in experiences, Figure 7 serves as a visualization of the typified housing recovery process in Sea Bright, as outlined by

respondents in the Process and Pitfalls questions. While I previously noted that many respondents offered assessments of the process rather than a systematic roadmap, a number of respondents did provide adequate detail of their experiences that I used to develop this figure.

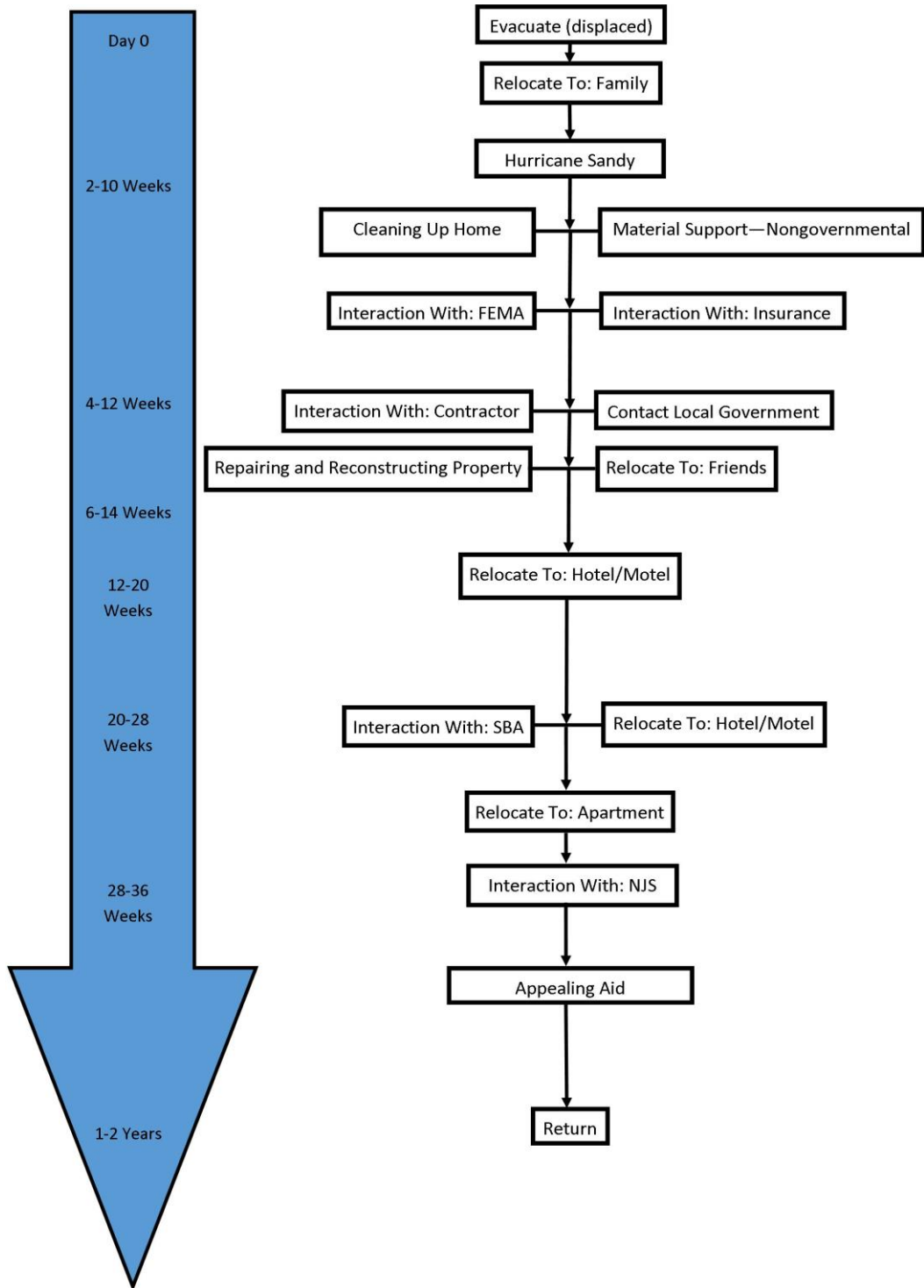


Figure 7: Typical Housing Recovery Process in Sea Bright As Described in Process and Pitfalls Questions

In Sea Bright, either respondents evacuated prior to Sandy's landfall or the police forced them to evacuate after Sandy due to gas leaks. The displaced respondents then had to decide where they would relocate. Often, respondents listed where they went each time they relocated, allowing me to detail where the typical respondent lived during the housing recovery process. The first place that displaced respondents relocated often was to stay with family members, but it is worth noting that a considerable amount of respondents noted that a hotel was their first stop. In addition to these locations, respondents indicated that they relocated to a number of places, including recreational vehicles (RVs), out-of-state to second homes or vacation homes owned by friends or family, shelters, their offices at work, and apartments found serendipitously through conversations with locals.

During this time often spent with family, the typical respondent began cleanup on their home, paying a contractor to treat the water damage, and began to contact FEMA and their insurance companies. They also began arranging to have contractors repair or reconstruct their homes. This is typically the period where respondents mentioned the importance of NGOs working in the area, noting the food, supplies, and free labor they provided. Then, usually a month after Sandy, respondents would relocate to live with friends, continuing to follow up with FEMA and their insurance companies, attending town hall meetings, and working on their homes. For a small portion of respondents, however, this is when they were able to move back into their home, either due to the lack of damage to the structure or undamaged floors they could inhabit during the recovery process.

Following this stay with friends, the typical respondent found assistance and moved into a hotel. If necessary, respondents spoke to the SBA or a bank around this time to see what their options were for taking out an additional loan or refinancing their homes. This was commonly followed by a move to another hotel, due to a lack of vacancies and an inability to lengthen their initial stay. Upon discovering that this process would take much longer than expected, respondents often eventually moved into an apartment while waiting on aid or for contractors to complete their home repairs. The typical respondent did not talk about interacting with the state of New Jersey until late in the process, often when they had already completed a large portion of the repairs necessary. A number of appeals and even lawsuits regarding the amount of aid and insurance coverage provided followed the initial aid application or insurance claim. While it was difficult to pinpoint when people typically either moved back into their homes or relocated to a new area with the intention to resettle, a number of respondents indicated that they were still on waitlists for aid, while others noted that they future still held a lot of ambiguity in respect to their residential status.

Discussion

Functioning.

While there are a number of subsequent factors that can contribute to the decision to relocate or resettle, researchers generally agree that underlying, pre-existing economic, political, or social factors can play an important role in that decision (Berke, Kartez and Wenger 1993; David and Mayer 1984; Dynes 1991; El-Hinnawi 1985; Fraser *et al.* 2003; Tobin 1992). Literature exploring the relationship

between minority status and residential decision-making emerged primarily following Hurricanes Katrina and Rita. In general, researchers found that minorities were more likely to resettle after a disaster (Fraser *et al.* 2003; Morrow-Jones and Morrow-Jones 1991; Peek and Weber 2012). In a similar area, researchers found in a number of tangential studies that factors like age (Fraser *et al.* 2003; Tobin 1992), marital status (Morrow-Jones and Morrow-Jones 1991), gender (Morrow-Jones and Morrow-Jones 1991), and education (Morrow-Jones and Morrow-Jones 1991; Paul *et al.* 2007) might correlate with residential decision-making. Many acknowledged, however, that this relationship may be spurious, and the actual cause might be hazard exposure, political representation, or another, unidentified variable.

The questionnaire explored these propositions by gathering data on race, gender, age, household makeup, education, and respondents' opinion on the three best and worst things about their communities before Sandy. Here, however, findings appear to challenge the literature. There was no significant relationship found between any demographic characteristic and household residential decision-making. This discrepancy could be due to a number of reasons. First, the sample, and population, of both case study sites is homogenous, not allowing enough variation to show potential differences. Second, there is a difference in scope. Most of these studies considered the individual as the decision-making unit, where this study posits that residential decisions are part of a collaborative decision-making process at a household level. If that assumption is true, individual characteristics would not affect the decision-making process, unless the assumption was that the individual characteristics reflected

household characteristics. Lastly, as suggested by many of the case studies cited, the relationship may be, in fact, spurious. Interviewees also mentioned pre-existing issues that either contributed to a decision to relocate or led them to believe they might move in the near future. These are covered in more detail in later sections, but as is suggested by Proposition 9A, interviewees cited issues predating Sandy that led them to want to relocate, such as the suitability and long-term resiliency of their communities.

Policies and plans.

Due to complicated property rights in the United States, there are a number of policies relevant when discussing government influence on post-disaster residential decision-making. Of special importance to this discussion is that land use management in the U.S. is a local responsibility, and it is difficult for the government to force households to relocate. This makes modifications to policies or legislation necessary for long-term hazard mitigation difficult to institute. When making these changes, researchers suggest community engagement is key, in an effort to plan with and not just for people, especially when attempting to change land-use patterns and relocate households out of hazardous areas (Bates 1982; Berke and Campanella 2006; Oliver-Smith 1991; Perry and Lindell 1997; Rubin and Barbee 1985; Smith 2011:239; Smith and Wenger 2007:241).

Hastily assembled resettlement plans that do not receive public input often fail, and people revert to prior settlements (Mileti and Passerini 1996; Tobin 1992). In addition, plans that take too long to develop or implement are often less likely to

succeed due to a loss of support (Fraser *et al.* 2003; Mileti and Passerini 1996). Since support for meaningful changes (such as building codes or land-use patterns) is often highest immediately after an event and there is a propensity to rebuild as quickly as possible, many researchers champion the idea of planning for recovery before a disaster (Berke, Kartez, and Wenger 1993; Rubin, Saperstein, and Barbee 1985; Paul *et al.* 2007). Often times, however, communities do not have recovery plans in place when affected by a disaster.

As indicated by its absence, I did not quantitatively test Propositions 1A, 1B, 1C, 9B, 11, or 13 for a couple of reasons. First, while previous work emphasizes the importance of policies, programs, and plans, a majority of these propositions did not lend themselves to quantitative (or qualitative) testing at a household level. For example, how does one measure buy-in from stakeholders in recovery plans (Proposition 11) via a questionnaire, without having this issue comprise a majority of the instrument? Further, propositions 1A, 9B, and 13 are not household-level propositions, and therefore I could not test them at the household level. Second, when prioritizing conceptual areas to examine, the amount of questions necessary to assess household or local government's knowledge of FEMA's HMGP and HUD's CDBG became prohibitive and eventually led to their exemption. I discuss the quantitative assessment of the role of incentives (provided by government programs), a related topic, under the "resources" subsection.

What the qualitative findings reflect, however, may show, in part, the results of not having recovery plans in place at the time of Hurricane Sandy, and a lack of

understanding of federal, state, and local policies by a number of stakeholders. An overwhelming portion of the qualitative findings centered on frustrations households experienced when contacting FEMA for aid money, dealing with flood insurance claims, or navigating the programs established by their respective state governments with federal funding. Households described the anxiety induced by every hoop they encountered on the windy path to recovery. They detailed the hours they spent working on aid applications, describing it as both a second job and the second disaster, only to have their paperwork lost by the agency or waitlisted into oblivion, without clear guidance on their next steps. A subset of the Oakwood Beach questionnaire responses did suggest, however, that for them the buyout process was smooth, fair, and necessary. There were also Sea Brighters that gave the Resettlement Program a favorable review, noting that it was the easiest money to acquire, although many did suggest it was a bribe.

While this may appear a biased, negative view of the aid process, I took steps to attempt to balance my understanding of this process. I completed a number of interviews with individuals involved in both the development and implementation of policies. To see extremes, I spoke to households that sustained a range of damages related to Sandy, from minor damage to complete losses. I made contact with a number of government agencies that either directly rejected my interview request or continually ignored my requests. When I noticed the negative orientation of the data, I restarted coding, paying special attention to any positive assessments of the process.

This set of findings is an especially useful contribution to our understanding of the process because this is an understudied subarea within the already meager area of disaster recovery. Previous studies in this area tend to focus on policies, either exploring buyouts specifically (c.f., de Vries and Fraser), housing recovery (c.f., Peacock), or the rare planning for post-disaster recovery (c.f., G. Smith). This study deepens our understanding of these concepts by offering mixed methods case studies. In addition, while disaster recovery as a subfield expanded tremendously following Hurricane Katrina, this study provides an in-depth exploration of disaster recovery in a qualitatively different setting. Finally, this study adds a dimension by factoring in how this recovery experience influences household residential decision-making.

Resources.

Buyouts within the U.S. are all legally voluntary, differentiating them from forced relocation in the international community associated with development and disasters. In the U.S. literature, however, studies of buyouts are limited, generally rooted in the field of urban planning. These studies focus on the elements influencing acceptance of buyout offers and the perceived voluntariness of the buyout offers. In summary, researchers found that attachment to place, risk perception, damage, appraisal of the fairness of the offer, and the general management of buyout programs influenced acceptance rates (Fraser *et al.* 2003; Green and Olshansky 2012). This is also important when considering the role of incentives in the decision-making process. Paul *et al.* (2007) suggest that the amount of people that relocate may depend, in part, on how quickly the government offers incentives, which could come in the form of tax

breaks, new employment opportunities, or discounts on new housing (Iuchi 2010). A gap in the literature, however, is that it does not consider the role of incentives when trying to attract households to return to an area.

While I did not find literature regarding incentivizing return, the literature was consistent on the importance of affordable housing in community recovery. Since local contractors manage redevelopment of housing, there is little motivation to rebuild low-income housing. Following Hurricane Katrina, redevelopers did not rebuild much of the low-income housing, resulting in an average rent increase of 35%, which took away the ability for low-income individuals to return to New Orleans (Padree 2012:63). This is also essential when considering the decision-making process for middle- and upper-class families as well, since home values often deteriorate over time when compared to new construction, which often dominates post-disaster or catastrophe environments. For this reason, researchers recommend families receive market replacement value for their homes if the goal is to incentivize return to an area, whether that comes in the form of grants, insurance payouts, low-cost loans, or a combination of these sources (Badri *et al.* 2006; de Vries and Fraser 2012; Fraser *et al.* 2003; Miller 2012:28; Paul *et al.* 2007).

In addition to incentives offered by the government, researchers also explored the role of household income in residential decision-making. Research, particularly conducted following Hurricane Katrina, suggests that low-income households are more likely to relocate (de Vries and Fraser 2012; Kirschenbaum 1996; Myers, Slack, and Singelmann 2008; Peek and Weber 2012), where high income homeowners were

more likely to return to New Orleans (Weber and Peek 2012:16). They often explained this by suggesting that low-income households did not have the resources necessary to return or rebuild their homes, where high income homeowners could control their housing future and had more influence on the recovery process.

While the household residential decision-making literature does not cover the role of emergent organizations in the decision-making process, the recovery literature suggests that emergent organizations are essential in community recovery. Since they are typically birthed from local sources in response to specific, localized needs, they have unique insights on community needs and the ability to alter their mission to meet new needs that many formal organizations do not have (Smith 2011:239; Stallings and Quarantelli 1985).

The state of New York offered approximately 63% of the respondents in this study a buyout for their homes. Of those offered a buyout, 85% accepted. Bivariate analysis showed that buyout offer returned one of the strongest Phi scores when compared to the Same Community and Same Address, suggesting that households offered a buyout were more likely to move than households not offered a buyout. As expected, this was not significant when exploring Reside plan, since the buyout offers had a window for acceptance. Quantitative findings regarding the role of buyouts in the residential decision-making literature are consistent with the literature on buyout offers, supports proposition 2, and offers further evidence that households often accept buyout offers.

Household income was not significantly related with residential decision-making for this study. This is counter to the literature and proposition 6. There may be a few explanations for this counter-finding. First, household income is homogeneous in both sites, so a lack of variation may explain the lack of significance. Second, since every piece of property in both sites is low-lying, there was not the opportunity for low-income homeowners to suffer more exposure to damage, which lowers the opportunity for damage to be a spurious relationship as the literature recognizes may be the case. While structural mitigation, and, in turn, the ability to pay for structural mitigation, may result in a difference in hazard exposure and thus serve as a proxy for income, height restrictions instituted by the Sea Bright local government restrict the amount of elevation possible. Lastly, based on the literature and findings, income appears to serve more as an enabler to decision-making, rather than a static push in one direction or another. Both sites are described as a desirable place to live, so wealthy individuals are enabled to begin their recovery in the absence of early aid or insurance payments, or able to absorb the financial impact of selling a property for a loss.

In Sea Bright, there was a moderate relationship between the perceived importance of the role of NGOs in household residential decision-making and Same Community and Same Address. Interestingly, households that rated help from NGOs as important in their decision-making process were more likely to have moved. For Oakwood Beach respondents, there was a significant relationship between Buyout Decision and their perception of the importance of NGOs in the decision-making

process. In a similar finding, households that accepted a buyout offer were more likely to rate assistance from NGOs as important in their decision-making process. This supports proposition 12 that NGOs play an important role in the decision-making process. There is an important distinction to draw here, however, when interpreting these results. The literature suggests that NGOs are important in disaster recovery, while what these findings suggest is that there is a statistically significant difference between the relative importance households that relocated assigned the role of NGOs in their residential decision-making process, versus households that rebuilt in situ. This does not necessarily imply that they helped households that relocated more than individuals that rebuilt. This difference could exist for a number of reasons. Households that rebuilt could see that help as important in their recovery, but inconsequential in the decision-making process; they decided to rebuild with or without the help. Since there was a lack of incentives to relocate in Sea Bright, households could have seen the help from NGOs as enabling them to relocate. In Oakwood Beach, since the state outsourced the day-to-day management of the buyouts to ProSource, a third party, respondents could have considered this group an NGO.

Since affordable housing and concerns about going into debt are closely related issues in the literature referenced above, both were considered when looking at the role of affordable housing in the residential decision-making process. In Sea Bright, the perceived importance of affordable housing and concerns about going into debt were only important in the decision-making process when compared to Same Address. These findings provide partial support for proposition 15. Same Community not being

statistically significantly related to the residential decision-making process, where Same Address is significant, makes sense in this case because Same Address would be more closely related to the cost of living than Same Community in such geographically small settings. What is more interesting, however, is why these variables were not statistically significantly related to the dependent variables in the Oakwood Beach sample. A couple of culprits come to mind that might explain this difference. First, the effect of the, by most accounts, reasonable buyout offer on over half the sample could lessen concerns over affordable housing. Second, attachment to place was much lower in Oakwood Beach, and risk perception was significantly higher, so these two variables may overshadow the importance of affordable housing.

When considering the perceived importance of incentives to rebuild in the residential decision-making process, a strong relationship was found for the Oakwood Beach sample for Same Community, Same Address, and Investment. Unsurprisingly, respondents that rated incentives to rebuild as important were more likely to live in the same location and plan to live there for an extended period. There were no significant relationships between incentives to relocate and the residential decision-making process for either sample. These findings provide partial support for proposition 16. A few potential causes may explain this difference. First, the State of New Jersey did not offer residents of Sea Bright incentives to relocate. Second, the questionnaire did not define incentives for respondents, calling into question how respondents understood incentives. Did they consider the buyout program, low-interest SBA loans, or grant

money an incentive? Future studies should clarify what is and is not considered an incentive on the instrument.

Qualitative findings were comparatively sparse for this section. Respondents offered a mixed review of the buyout program in the Process and Pitfalls sections, where some praised the straightforward nature of the process, others noted that it took multiple follow-up contacts to proceed. While the question did not appear explicitly, a number of respondents indicated that they did not feel they had a choice in the process. While no one argued that the state physically forced him or her to sign on the dotted line, a portion of respondents did suggest that they were compelled to take the offer. Respondents mentioned peer pressure, while others noted that they did not feel they had a choice in the face of an uncertain future for the community. An untouched area within the literature that future studies should explore is the process for renters, since they are even less empowered to make a decision to remain in their home or the area in these sorts of situations.

Interviewees not offered buyouts, however, generally split on the efficacy and desirability of a buyout program. Even the mention of a buyout appalled a number of interviewees from Sea Bright. They saw buyouts as a threat to the stability and ultimate existence of their community. If history serves us correctly, their assumptions are probably right. Others lit up at the idea, and almost appeared offended that households in another area received this chance to restart while they were not afforded the opportunity. They viewed buyouts as a chance to get out from under their current mortgage, out of harm's way, and a chance to put the storm, and the long-term

recovery process and all the paperwork it came with, behind them. Feelings on a large decision like this are often irreducible to a binary decision-tree, however, and a number of interviewees felt they might be interested in a buyout, but they would have to spend time considering an offer. Qualitative findings, due to limitations in the sample, present incomplete evidence to support proposition 2, but show interesting results for a hypothetical buyout in Sea Bright which researchers should pursue in later studies.

Respondents often mentioned the role of NGOs in their recovery. They would laude the efforts of local businesses or emergent organizations in the immediate recovery period to meet their short-term, essential, life-sustaining needs. In the long-term, they cited organizations such as Catholic Charities meeting needs that the formal aid system did not meet. Interestingly, the items interviewees cited NGOs helping them with most logically help them stay in the area, not leave. These findings support the important role of NGOs in disaster recovery suggested by the literature. This is not, however, in contrast to the questionnaire findings since they focus more on the perceived importance of these organizations in the decision-making process.

When discussing their housing, respondents often discussed challenges associated with acquiring funding necessary to repair their homes. While SBA loans were available, a number of interviewees mentioned that they could not imagine incurring any additional debt, given that they currently existed in an unsure state, questioning their long-term residential plan, the amount of aid they might or might not acquire, and were unsure about flood insurance requirements for rebuilding, which

were in flux at that time. In most cases, however, interviewees lamented how their current financial situation handcuffed them to repairing their homes. They could not afford to walk away from their homes and incur the remaining mortgage, but in its current condition, the house was essentially worthless. Then, if they could acquire the funds necessary to repair, a number of interviewees noted that their home would have lost a substantial portion of its value, forcing them to stay.

So, in this situation, often the only affordable housing they recognized was to continue working toward repairing their current home, whether that meant incurring new debt or tapping into retirement funds, creating new uncertainties in the future. These findings present an interesting conundrum when considering proposition 15. While past studies focused on providing affected populations with new, affordable properties, in this case it is less about the ability to acquire new affordable properties as empowering their recovery. This may be due to differences in populations from Katrina to Sandy, changes in scale of studies, or variability in land use patterns, where in both Oakwood Beach and Sea Bright there is limited undeveloped property.

Impacts.

One of the most consistent findings in this small body of literature is that there is a relationship between the decision-making process and the level of damage inflicted by the disaster (Emily and Storr 2009; Green and Olshansky 2012; Kirschenbaum 1996; Miller and Rivera 2007; Myers, Slack, and Singelmann 2008; Wilson and Stein 2006). Studies suggest this is a positive relationship: the more damage done by the disaster, the more likely the family was to relocate and resettle.

Green and Olshansky (2012) also suggest that more damage increases likelihood to accept a buyout offer.

A number of studies explored the presence of stress in recovery, more specifically in resettled populations (Badri *et al.* 2006; de Vries and Fraser 2012; Mileti and Passerini 1996; Riad and Norris 1996; Shaw and Ahmed 2010). Passerini (1996) notes that relocation and resettlement often increase stress, resulting in an increased prevalence of depression, suicide attempts, post-traumatic stress disorder, heart attacks, strokes, etc. Other studies, like Badri *et al.* (2006) or Scudder and Colson (1982:269), propose models that categorize types and triggers of stress associated with relocation and resettlement efforts at a community level. Most of these studies, however, look at a macro, community scale and do not discuss stress and the results of stress (specifically, long-term recovery stress) at a household level.

Much of the literature exploring residential decision-making suggests that experiences households have while navigating their own housing recovery often change their perception of their community and influence their residential decision-making process. Studies suggest that the direct and indirect short-term and long-term effects of the disaster are crucial in their residential decision-making process. Changes in their attachment to place (Fraser *et al.* 2003; Emily and Storr 2009), post-event assessments of community functioning (David and Mayer 1984; Tobin 1992), and experiences navigating programs established to assist in their recovery (Fraser *et al.* 2003) factor into their long-term residential planning, where negative assessments early in the process may lead to relocation and resettlement.

Respondents answered questions both pertaining to damage and disruption. Disruption was a novel measure, not explored in previous studies but that would logically lower community satisfaction and inhibit recovery efforts. In Sea Bright, there was a statistically significant relationship between damage done by the hurricane and the residential decision-making process. Respondents that thought their home had sustained extensive damage were more likely to move than respondents that thought their home sustained less extensive damage. Disruption returned mixed results. Sea Brighters that perceived travel disruption outside of their community were more likely to have rebuilt. When considering the importance of the ability to travel both within and outside Oakwood Beach, respondents noted that this was critical in their residential decision-making status. In this case, respondents that felt their ability to their community as important were more likely to live at the same address than respondents that did not rate this as important. These findings support proposition 5, and show clear support for the inclusion of measures of disruption in future studies.

When discussing damage, interviewees from Sea Bright often highlighted the loss of shops and services and the interrelated slow speed of community recovery. They highlighted specific losses, especially the town library and post office, as cultural icons lost, suggesting that they lowered the quality of life in the area. Respondents detailed the effects of disruption in the qualitative sections of the questionnaire. Respondents from both case study sites highlighted the physical location of their community as one of the best things about their community prior to Sandy, allowing them to travel easily to surrounding areas, especially Manhattan.

Traffic was also a prominent issue for both sites, where one interviewee from Sea Bright mentioned that there were 100 days of the year where they did not drive at all on the weekends. Interestingly, when discussing the worst things about their community after Sandy, proximity to other places re-emerged in both locations. This could be explained by the fact that words like “isolation” trended in post-worst as well and the temporary loss of public transportation to places like Manhattan. These findings also support proposition 5, and further suggest that disruption is an understudied component, or could be a component of damage influencing the residential decision-making process that other studies neglect. Future studies should explore both of these areas, and use statistical tests to control for these issues to understand relative influence.

The preponderance of both questionnaire respondents and interviewees offering unprovoked data on stress, especially related to the long-term recovery effort was not an expected outcome of this study. The mere amount of emergent data on stress and issues coping with stress provides evidence for proposition 3. Future studies should further consider the role of stress in long-term recovery, and consider how issues like paperwork and a lack of normalcy affect decision-making in a stressful environment.

When considering how experiences post-Sandy affected residential decision-making, one of the most telling data sources was shifts from pre- to post- in both best and worst things about each community. While it is important to consider that Sandy likely influenced pre-Sandy assessments in a post-Sandy environment, these data

showed significant shifts. In Oakwood Beach, a number of categories related to the natural and spatial environment dropped dramatically from pre- to post-best. Since a little less than half the residents moved, it is not surprising that spatially sensitive variables dropped, including “proximity to other places” and “neighbors”. When considering the gap between pre- to post-worst, less people listed hazard exposure and environmental concerns. This change could be due to a rise in other concerns or to a move away from areas that exposed them to those concerns. In Sea Bright, a number of categories related to the physical setting and attachment to place lost respondents when shifting from pre- to post-best, which may be explained by the mediating effect of damage and disruption. When examining pre- to post-worst, issues related to the rate of recovery and the ability to travel gained respondents, where issues related to hazard exposure lost respondents. Again, the gained importance of travel may be explained by damage and disruption, where the loss of importance of hazard exposure may be due to relocation, post-event mitigation, or increased importance of other issues (like travel disruption).

Chapter 6

CONCLUSIONS

Finally, from so little sleeping and so much reading, his brain dried up and he went completely out of his mind.

- Miguel de Cervantes Saavedra

Disasters challenge the way society organizes itself by exposing areas that society failed to adapt to their surrounding natural and social environments. This challenge requires adaptation on the part of individuals, households, communities, and government to rethink the protections in place for lives and property. These efforts occur simultaneously: while government considers and institutes measures to reduce vulnerabilities, households make decisions about how to protect themselves from future losses. In light of recent catastrophes, government, researchers, and the media are all devoting more attention to the recovery phase of disaster management, and considering the potential benefits and costs of a systematic abandonment of the coastlines.

Research on disaster recovery, however, is meager at best. Household residential decision-making, as a tangential component of disaster recovery, suffers a similar fate. Most studies set in a U.S. context are anecdotal, and explore the issue as a one-dimensional, cost-benefit analysis problem, discounting the sociopolitical implications of relocation and resettlement efforts. Empirical studies often tangentially explore issues related to household residential decision-making, and focus on related

issues, such as evacuation behavior or displacement. This study addresses that gap by contributing to our understanding of how households decide where to live after a disaster. This work contributes an exploratory study, providing insight on the factors that influenced the decision-making process within the larger context of community recovery. Hurricane Sandy furnished a valuable opportunity to study this phenomenon in a setting unexperienced with damage to this scale with unique demographic characteristics that set it apart from the body of literature emerging following Hurricane Katrina and other recent catastrophes.

Contributions

Major findings.

The goal of this exploratory research was to build the foundation for future studies by identifying the factors that influence the decision-making process at the smallest reducible level, the household. To that end, this study provides one of the first mixed-methods explorations of this topic. The findings offer one of the first empirical examinations of residential decision-making at a household level. Table 32 serves as a summary of my findings. Chiefly, I found strong evidence that pre-event functioning, attachment to place, risk perception, destruction of the built environment, incentives, the availability of buyouts, and post-event functioning influenced the household decision-making process. Mixed evidence supports the role of perceptions of trustworthiness of officials and NGO support. Counter to the literature, I did not find evidence that demographics and individual-level indicators influence the household decision-making process. Qualitative findings also highlighted that this was not

typically a one-dimensional decision-making process. Interviewees often noted multiple components listed above as having a critical role in their decision-making process. In a surprising finding, I discovered that many households consider many of the elements listed above in their decision-making process, but consider themselves bound by financial realities and, as a result, feel disempowered in the decision-making process.

Table 32: Summary of Findings.

Not tested

Proposition 1A - Federal, state, and local policy may affect household and community residential decision-making.
Proposition 1B - Knowledge of FEMA's HMGP funding may be an important influence in this process.
Proposition 1C - Knowledge of HUD's CDBG funding may be an important influence in this process.
Proposition 9B - Pre-event disaster recovery planning may facilitate community resettlement.
Proposition 11 - Policy is the product of multiple interested parties working toward a common goal. Without buy-in from these stakeholders, it is highly unlikely that new policy will be instated or that voluntary resettlement will be achieved.
Proposition 13 - The nature of, or lack of, recovery and resettlement planning may affect resettlement outcomes.

No evidence

Proposition 6 - Household income and access to resources may affect household residential decision-making.
Proposition 7 - Minority status may affect household residential decision-making.
Proposition 10A - Demographic differences among households may affect residential decision-making.

Mixed evidence

Proposition 3 - Resettlement may result in increased levels of physiological, psychological, and sociocultural stress for household members.
Proposition 10B - Differences in trust in governance among households may affect residential decision-making.
Proposition 12 - The existence of and work of emergent groups may affect residential decision-making.
Proposition 15 - The availability of affordable, appropriate housing may affect resettlement outcomes.

Strong evidence

Proposition 2 - The availability and perceived voluntariness of buyouts may affect household residential decision-making.

Proposition 4 - Attachment to place may affect household residential decision-making.

Proposition 5 - The level of damage to the physical environment may affect household residential decision-making.

Proposition 8 - Household risk perception may affect residential decision-making.

Proposition 9A - Pre-existing, negative conditions may affect post-disaster residential decision-making.

Proposition 14 - The process and both positive and negative events from the moment of displacement to the beginning of resettlement may affect household residential decision-making.

Proposition 16 - Financial incentives offered may affect household residential decision-making.

Past identifying factors, this study added nuance to the literature by parsing constructs into their components and exploring how they relate to the decision-making process. For example, this study found that risk of recurrence (a component of risk) offered the most predictive power whether or not a respondent accepted a buyout offer. This work also introduced new concepts to this literature, including measures of disruption resulting from destruction, and tested established measures developed outside the disaster setting in a disaster setting, such as attachment to place.

This study extended past studies by conceiving of household residential decision-making as a process and not a point decision. Previous studies set this decision up as a binary, cross-sectional decision made once, to never change. By asking respondents about their residential plan, this study examines this phenomenon, this process more honestly. The literature suggests that individuals often move several times following a disaster before they ever settle, if they do ever settle, so it is

dishonest to assume this is a cross-sectional phenomenon. While longitudinal research is methodologically preferable to asking about predicted behavior, the evacuation literature shows that this is often a strong predictor of future behavior. Interviews and open-ended questions showed that within the household, multiple members of the household voice their concerns and opinions, resulting in a negotiated decision that is apt to change with new evidence. Future studies should capitalize on qualitative methods, such as group interviews and focus groups, which will allow for examination of this dialogue, negotiation, and exchange.

The anchoring effect.

The models in this area proposed by past studies reflect the literature: atheoretical, lacking consistency, and tangential. Most of the models represented in the literature review are outcomes models, and for the reasons listed in the previous paragraph, outcome models do not work for ongoing processes. The Push-Pull model, however, might be the exception. As a reminder, this model suggests that noxious forces (such as pollution or crime) push individuals out of a community, and attractive features provided by other communities (such as employment opportunities) pull individuals to that community. While Wolpert designed this model to explain large-scale migrations, it may serve, with modification, as a tool to explain behavior at a household level.

The modification to this model I recommend is what I am terming an “anchoring effect”. What I found is that a number of factors served as push factors in my two communities, such as hazard exposure, pollution, perceptions of community

functioning, etc. What I did not find, however, were pull factors. People were not telling me about pull factors, or the great parts of the city they planned to or had moved to following Hurricane Sandy. Instead, they listed reasons not to leave where they loved living, or issues they could not rectify in a manner that kept them in their current community. This contribution requires future studies to flesh out the concept (ex – are anchoring and pull factors additive? Compounding?), decide if it is an addendum to the Push-Pull model, or its own model altogether.

Variable policies and a convoluted process.

An important finding resulting from this study with significant policy implications is that while policies envision disaster recovery as a linear process, the data suggests that households have a different interpretation of the process.

Respondents often offered overall assessments of the process, when I asked instead for the steps in the housing recovery process, which shows that they do not see it as linear, or containing a straightforward process that they could clearly express in a page response. They argued that the process was confusing, as much of a burden as a second job, and laden with arbitrary deadlines that did not match up with their needs.

Interviewees did not understand why they would take out a loan when a grant might be on the way, and why they had to sign for a loan without knowing if they would receive the grant money to help pay for it. As suggested above, many respondents and interviewees still had not set their long-term plans, but the rules surrounding the grants and loans did not allow for ambivalence.

This last point relates to the next critical issue identified. Since a majority of the aid money the states used to meet housing needs came from CDBG-DR appropriations, they had to follow HUD requirements. While the HUD requirements are in place for a reason, many of them, such as “no direct rental assistance”, complicated the ability of the state governments to meet the post-disaster housing needs of their citizens. As one resident of Sea Bright put it, “they didn’t provide anything out of their OLD calculated policy and didn’t allow room for different circumstances.” Interviewees suggested that these strict policies were a result of failures during Katrina.

The state worked within the bounds of these policies, and at times outside with consent from HUD, and found innovative ways to meet those needs, including grants for property owners to prorate the rent cost. The public, however, did not always see these adaptations of legacy policies as a positive development. While the state thought they were altering programs to meet needs, people often saw it as cumbersome, a sign of a lack of organization, and not in their best interests. A number of respondents noted changes in programs as negative developments and, in a number of cases, households quit the process due to the confusion and extra work this created.

A central database would serve as a method to address some of this confusion and frustration. Much of the dissatisfaction expressed by respondents and interviewees centered on the amount of paperwork they had to complete, duplicate or similar paperwork, and lost paperwork. A recommendation heard from a number of

interviewees was that the government create and control a singular database that different agencies could access to streamline aid applications.

[S1]: It's a shame that they didn't have a database where, okay this happened to you, okay FEMA, you know whatever. And then any program after could just take tap into it and be like "Okay, here's her paystubs or here's, you know" because this stuff is constantly being asked for and it's the same kind of information being asked over and over again. I get asked "Where's your FEMA declaration letter?" and then it's like yeah, okay now I have to dig it out and give it to another person.

[S2]: Yes. And then you provide it to them, and then later on, they ask for it again because they may look at it. Say you qualify, and then later on, they need it for other things. It's just a constant mirage, which it really gets to the point where it's like I can't do this anymore. I'm just out of my mind. You know, and now there's the ICC money, which is to raise, and then there's hazard mitigation, that's a grant...

While there are a number of concerns with digital information security, especially in light of recent information compromises, the benefits may outweigh the risks.

First, with a digital cataloging system, it would be more difficult to lose paperwork, and this system eliminates the chances for losing paperwork multiple times, barring a catastrophic data loss. Second, one of the major concerns with federal money is avoiding a duplication of benefits, and a central database like this offers a way to monitor for this sort of issue. Third, by streamlining the application process, agencies can distribute money quicker, reducing attrition rates. Lastly, changes to programs require little to no additional work on the part of the affected household, and it gives agencies a database to contact individuals with change notices, possibly even via e-mail to reduce costs.

A system like this would require a substantial amount of cooperation on the front end on the part of government agencies. They would need to streamline their

own aid applications, create an application that covered the needs of major agencies, and create a mechanism to store and control access to the database. While this appears a bit daunting, the Free Application for Federal Student Aid (FAFSA) serves as a model to show that such a system is possible and works relatively well. If a system for consolidating aid applications can be created for students applying for college aid, it can be created for those affected by disasters, attempting regain a sense of normalcy.

Planning for recovery.

Developing recovery plans before a disaster could prevent a number of these post-event issues. In the disaster literature, a number of researchers detail the value of recovery plans, decry the lack of pre-event planning for disaster recovery, and push government at all levels to develop these plans (Berke and Campanella 2006; Berke, Kartez, and Wenger 1993; Mileti and Passerini 1996; Paul *et al.* 2007; Rubin, Saperstein, and Barbee 1985). When states and localities plan for recovery, they spend time anticipating potential issues they may encounter during short- and long-term recovery and can work with the federal government ahead of time to address some of these foreseen dilemmas. Even with the resounding support in the literature for recovery planning, it was such an apparent blind spot in this case that interviewees deplored its absence. As one interviewee noted:

There's no playbook, there's no book that says here's the steps we need to take when an event like this occurs. And you hope you never have to go to the book. And people were just running around like chickens with no heads, trying to put out fires. Not literal fires, you know what I mean.

Recovery plans, in short-term recovery, offer planners the opportunity to pre-identify needs they may have immediately after the disaster and allow them to develop and test solutions to enhance short-term recovery. For example, if a city and state can plan together and develop a system to approve the influx of building permit requests following a disaster, which was an issue noted by interviewees in Sea Bright, construction could begin quicker and enable residents to re-enter a community following disaster. These efforts can compound, as well, because a return of residents also provides businesses with their necessary clientele, enhancing their recovery efforts. An additional example might involve developing mutual aid and assistance agreements with other areas well outside a predicted impact area to help handle these increased demands.

Beyond developing plans for potential issues, establishing contacts, and developing relationships, recovery planning allows entities to recreate their community and plan to address existing issues. If the goal is to incentivize rebuilding, having a program in place to scrutinize contractors before the disaster so the process is streamlined could help households return quicker and prevent attrition. If, on the other hand, the goal is to reduce vulnerability through the acquisition of properties, recovery plans offer an opportunity to both increase the likelihood of a successful buyout effort and a chance to increase the odds of success before an event occurs. Using recovery planning as an opportunity to identify hazardous zones, evaluate the potential social, environmental, and financial impacts of a buyout program, and gain community input and buy-in prior to a disaster provides communities with tools to eliminate future

disaster losses for that area. This research also provides powerful tools for those recovery plans. If the purpose of policy were to influence behavior, knowing the factors that influence residential decision-making would be an invaluable tool for community planners when constructing recovery plans.

Limitations

I highlighted a number of the limitations to this study throughout the manuscript, but a few remain that are worth discussing for future studies. Since this study was exploratory, I did not control for other factors in my quantitative analysis. While the qualitative analysis did offer confirmation and validation of findings in many cases, explanatory studies using advanced quantitative methods should make this a focal point of their study. Anytime researchers use a mail questionnaire, inevitably all the addresses are not correct, which means groups of people are not reached. Disasters exacerbate this issue, with homes and mailboxes destroyed, creating hardships when trying to understand the experience of those households. This method also does not capture the experiences of individuals without housing or that are already in transitional housing at the time of the disaster.

As mentioned a number of times throughout the manuscript I sensed, and patterns in the data suggested, that a corrosive community developed in Sea Bright following Sandy. A number of these individuals refused to participate in the study, leading to a dataset that potentially and probably portrays a much rosier picture than reality reflects. In future studies that require coding schemes to keep track of participants, I recommend, and will myself, make efforts to acquire a National

Institute of Health Certificate of Confidentiality to assure potential participants that their data is safe.

Future Research

Given that this dissertation was an exploratory investigation into the factors affecting residential decision-making, it served to highlight a number of areas for future inquiry. Since a number of the topics I thought would affect residential decision-making relate to community recovery, I have an incredible amount of data regarding community recovery I have not explored in that context. One area I plan to probe in the near future is the relationship between position in the recovery process (related to social time indicators) and community satisfaction.

Where this dissertation served as an exploratory study to identify factors influencing the decision-making process, a logical next step is to explore these factors in more depth. For example, I believe based on findings from this research that a study focused on the perception of damage done by a disaster, risk perception, and likelihood to rebuild could shed more light on this nuanced relationship. Probit regressions and structural equation modeling could help put weights on these factors too, furthering our knowledge not just of relevant factors but understanding their relative importance. In future studies, I plan to complete this work, resulting in the construction of a weighted model that identifies the factors affecting residential decision-making.

To expand and validate my findings, I plan to replicate this study in other settings. In one interview in Sea Bright, I encountered a quote that haunted me

throughout the rest of the study and the construction of this manuscript. An interviewee noted, when asked if they felt safe, that "...if there was ever another evacuation order I will leave so I'll be safe. I don't wake up every morning to tornadoes and earthquakes." This led me to consider the differences I might find if I replicated this study in a new location with a similar population that experienced a different hazard with a dissimilar evacuation lead-time. For that reason, I plan to replicate this study in a location that recently experienced a tornado or earthquake to look for differences in the factors, the expression of those factors, and their relative importance in the residential decision-making process. Through replication in the wake of a technological- or development-induced displacement, I also plan to challenge the assumption posited by the literature that the mechanism of displacement is not a critical element in a relocation or resettlement effort.

While recovery planning is desirable, if history serves, assuming we will start planning for recovery is an ill-advised gamble. If we are not moving toward recovery planning, another useful study emerging from this work is to understand how states decide how to use loosely regulated block grants. How are states learning as they go? Do they meet the needs of their citizens better in a repeat event? To put that another way, was aid delivery following Sandy better than it was following Irene? How is scientific learning institutionalized in the wake of disaster, especially in these areas like the U.S. Northeast that does not have extensive experience with hurricanes?

REFERENCES

- ACE. 2013. *Oakwood Beach, Staten Island, NY: Repair of Previously Constructed Projects*. Retrieved
([http://www.nan.usace.army.mil/Portals/37/docs/civilworks/SandyFiles/Army Corps OakwoodBeach_FCCE_FactSheet.pdf](http://www.nan.usace.army.mil/Portals/37/docs/civilworks/SandyFiles/Army%20Corps%20OakwoodBeach_FCCE_FactSheet.pdf)).
- Anon. 1891. "The Sea Bright Fire." *Sacramento Daily Union*, June 18. Retrieved
(<http://cdnc.ucr.edu/cgi-bin/cdnc?a=d&d=SDU18910618.2.3>).
- Arnold, Christopher. 1993. *Reconstruction after Earthquakes: Issues, Urban Design, and Case Studies*. San Mateo. National Science Foundation.
- Ashman, Brittany, Emily Blackman, Elizabeth Browder, Patricia Gouris, Chris Grigsby, Bill Haslag, Chris Kok, Rewa Marathe, Steven Martini, Dori Nguyen, Megan O'Leary, Greer Reinalda, Raimy Schutzman, Amy Winter, Allan Zaretsky, and Lori Zeller. 2013. *Resilient Rebuild: Sea Bright, New Jersey - Strategies for Long-Term Recovery*. Retrieved
(http://policy.rutgers.edu/academics/projects/studios/Sea_Bright_NJ_Resilient_Rebuild_Studio_Report.pdf).

- Bachman, Ronet and Raymond Paternoster. 2008. *Statistical Methods for Criminology and Criminal Justice*. (3rd edition). New York: McGraw-Hill.
- Badri, Ali, Ali Asgary, A. R. Eftekhari and Jason Levy. 2006. "Post-Disaster Resettlement, Development and Change: A Case Study of the 1990 Manjil Earthquake in Iran." *Disasters* 30(4):451-68.
- Baker, Sarah and Rosalind Edwards. 2012. "How Many Qualitative Interviews Is Enough?" National Centre for Research Methods. Retrieved October 9, 2013 (<http://eprints.ncrm.ac.uk/2273/>).
- Barr, Meghan. 2013. "Sandy Buyouts In New York Only Affect Few Lucky Homeowners In Staten Island." *Huffington Post*. Retrieved March 10, 2014 (http://www.huffingtonpost.com/2013/10/28/sandy-buyouts_n_4169483.html).
- Bartlett, M. (1954). "A Further Note on the Multiplying Factor for Various X² Approximations in Factor Analysis." *Journal of the Royal Statistical Society* 16:296-298.
- Bates, Frederick L. 1982. *Recovery, Change, and Development: A Longitudinal Study of the 1976 Guatemalan Earthquake*. National Science Foundation.
- Becker, William. 1983. *Come Rain, Come Shine: A Case Study of a Floodplain Relocation Project at Soldiers Grove, Wisconsin*. Report for the Bureau of Water Regulation and Zoning, Wisconsin Department of Natural Resources.

- Berg, Bruce and Howard Lune. 2012. *Qualitative Research Methods for the Social Sciences*. Upper Saddle River: Pearson Higher Education, Inc.
- Berke, Philip and Thomas Campanella. 2006. "Planning for Postdisaster Resiliency." *Annals of the American Academy of Political and Social Science* 604:192-207.
- Berke, Philip, Jack Kartez and Dennis Wenger. 1993. "Recovery after Disaster: Achieving Sustainable Development, Mitigation and Equity." *Disasters* 17(2):93-109.
- Bevington, J. S., A. A. Hill, R. A. Davidson, S. E. Chang, A. Vicini, B. J. Adams and R. T. Eguchi. 2011. *Measuring, Monitoring, and Evaluating Post-Disaster Recovery: A Key Element in Understanding Community Resilience*. in Structures Congress. Reston, VA.
- Bin, Okmyung, John Bishop, and Carolyn Kousky. 2011. *Redistributional Effects of the National Flood Insurance Program*. Resources for the Future. RFF DP 11-14.
- Birkland, Thomas. 2011. *An Introduction to the Policy Process: Theories, Concepts, and Models of Public Policy Making*. (3rd edition). Armonk: M.E. Sharpe.
- Black, Richard, Dominic Kniveton, and Kerstin Schmidt-Verkerk. 2011. "Migration and Climate Change: Towards an Integrated Assessment of Sensitivity." *Environment and Planning A* 43:431–50.

- Bolin, Robert and Louis Stanford. 1998. "The Northridge Earthquake: Community-Based Approaches to Unmet Recovery Needs." *Disasters* 22(1):22-38.
- Brady, Jeff. 2013. "After Sandy, Can The Jersey Shore Come Home Again?" *NPR*. Retrieved October 10, 2014 (<http://www.npr.org/2013/01/03/168555442/after-sandy-can-the-jersey-shore-come-home-again>).
- Briggs, Xavier de Souza. 2006. "After Katrina: Rebuilding Places and Lives." *City and Community* 5(2):119-28.
- Brown, Jared and Francis McCarthy and Edward Liu. 2013. "Analysis of the Sandy Recovery Improvement Act of 2013." Congressional Research Service. Retrieved April 28, 2014 (<https://www.fas.org/sgp/crs/misc/R42991.pdf>).
- Burby, Raymond. 2006. "Hurricane Katrina and the Paradoxes of Government Disaster Policy: Bringing about Wise Governmental Decisions for Hazardous Areas." *Annals of the American Academy of Political and Social Science*, 604:171-191.
- Campanella, Thomas. 2006. "Urban Resilience and the Recovery of New Orleans ". *American Planning Association* 72(1):141-46.
- Castles, Stephen. 2002. *Environmental Change and Forced Migration: Making Sense of the Debate*. Vol. 70. The United Nations Refugee Agency.

- Cernea, Michael. 1997. "The Risks and Reconstruction Model for Resettling Displaced Populations." *World Development* 25(10):1569-87.
- Cernea, Michael. 2000. "Risks, Safeguards, and Reconstruction: A Model for Population Displacement and Resettlement." *Economic and Political Weekly* 35(41):3659-78.
- Chan, Ngai. 1995. "Flood Disaster Management in Malaysia: An Evaluation of the Effectiveness of Government Resettlement Schemes ". *Disaster Prevention and Management* 4(4):22-29.
- Christie, Chris, Kim Guadagno, and Richard Constable II. 2013. "Community Development Block Grant Disaster Recovery Action Plan." Retrieved April 28, 2014 (<http://www.state.nj.us/dca/announcements/pdf/CDBG-DisasterRecoveryActionPlan.pdf>).
- Coburn, A.W., JD Leslie and A. Tabban. 1984. "Reconstruction and Resettlement 11 Years Later: A Case Study of Bingöl Province, Eastern Turkey." Paper presented at the Earthquake Relief in Less Industrialized Areas. International Symposium.
- Colson, Elizabeth. 1971. *The Social Consequences of Resettlement: The Impact of the Kariba Resettlement Upon the Gwembe Tonga*. Manchester, England: Manchester University Press.

Correa, Elena, Fernando Ramírez and Haris Sanahuja. 2011. "Populations at Risk of Disaster: A Resettlement Guide." The World Bank.

Creswell, John W. 2009. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. (3rd edition) Thousand Oaks: Sage Publications, Inc.

Cuba, L., and D. M. Hummon. 1993. "A Place to Call Home: Identification with Dwelling, Community and Region." *The Sociological Quarterly* 34:111–31.

Cuomo, Andrew, and Darryl Towns. 2013. *Floodplain Management Document*. Retrieved November 20, 2014 (http://www.nyshcr.org/Programs/NYS-CDBG-DR/OakwoodBeach-RichmondCountyNY_FinalDraftFloodplainManagementPlan.pdf).

David, Elizabeth and Judith Mayer. 1984. "Comparing Costs of Alternative Flood Hazard Mitigation Plans: The Case of Soldiers Grove, Wisconsin." *Journal of the American Planning Association* 50(1):22-35.

de Vries, Daniel and James Fraser. 2012. "Citizenship Rights and Voluntary Decision Making in Post-Disaster U.S. Floodplain Buyout Mitigation Programs." *International Journal of Mass Emergencies and Disasters*. 30(1):1-33.

De Wet, Christopher. 2006. Risk, Complexity, and Local Initiative in Forced Resettlement Outcomes. In *Towards Improving Outcomes in Development*

Induced Displacement Problems, Policies, and People, edited by Chris de Wet.
Oxford and New York: Berghahn Books.

Dillman, Don. 1978. *Mail and Telephone Surveys: The Total Design Method*. New York: Wiley.

Dynes, Russell. 1991. "Disaster Reduction: The Importance of Adequate Assumptions About Social Organization." Disaster Research Center Preliminary Paper.

Eadie, Charles. 2011. "The Restorative, Transformative, and Economic Streams Of Community Recovery Following Disaster." in *PERI Symposium: Community Recovery from Disaster*.

El-Hinnawi, Essam. 1985. "Environmental Refugees." United Nations Environment Program.

Emily, Chamlee-Wright and Virgil Henry Storr. 2009. "'There's No Place Like New Orleans: Sense of Place and Community Recovery in the Ninth Ward after Hurricane Katrina.'" *Journal of Urban Affairs* 31(5):615-34.

FEMA. 2002. "National Flood Insurance Program: Program Description." Retrieved March 28, 2014 (http://www.fema.gov/media-library-data/20130726-1447-20490-2156/nfipdescrip_1_.pdf).

FEMA. 2009. "National Disaster Housing Strategy." Retrieved March 28, 2014 (http://www.fema.gov/media-library-data/20130726-1819-25045-9288/ndhs_core.pdf).

- FEMA. 2010. "Hazard Mitigation Assistance Unified Guidance." Retrieved March 30, 2014 (http://www.dhses.ny.gov/oem/mitigation/documents/FY2011-HMA-Unified_Guidance.pdf).
- FEMA. 2011a. "National Disaster Recovery Framework." Retrieved March 28, 2014 (http://www.fema.gov/pdf/recoveryframework/housing_rsf.pdf).
- FEMA 2011b. "A Guide to the Disaster Declaration Process and Federal Disaster Assistance." Retrieved March 28, 2014 (http://www.fema.gov/media-library-data/20130726-1536-20490-8240/dec_proc.pdf).
- FEMA. 2012, "Hazard Mitigation Assistance - Property Acquisition (Buyouts)". Retrieved September 30, 2013 (<http://www.fema.gov/application-development-process/hazard-mitigation-assistance-property-acquisition-buyouts>).
- FEMA. 2013a. "A Year After Hurricane Sandy: New Jersey Recovery By The Numbers." Retrieved April 28, 2014 (<http://www.fema.gov/news-release/2013/10/25/year-after-hurricane-sandy-new-jersey-recovery-numbers>).
- FEMA. 2013b. "A Year After Hurricane Sandy: New York Recovery By The Numbers." Retrieved April 28, 2014 (<http://www.fema.gov/news-release/2013/10/24/year-after-hurricane-sandy-new-york-recovery-numbers>).
- FEMA. 2013c. "Insurance Rates: What They are and How to Explain Them." Retrieved April 26, 2014 (<http://www.fema.gov/media->

librarydata/13821151156660fba8b9a68fef69d546513c6da105bbe/BW12_AgentWhat_to_Know_Say_Sect_205_Sept2013.pdf).

FEMA. 2013d. "New Jersey Hurricane Sandy (DR-4086)." Retrieved April 26, 2014 (<http://www.fema.gov/disaster/4086>).

FEMA. 2013e. "New York Hurricane Sandy (DR-4085)." Retrieved April 26, 2014 (<http://www.fema.gov/disaster/4085>).

FEMA. 2013f. "National Strategy Recommendations: Future Disaster Preparedness." Retrieved April 26, 2014 ([http://www.fema.gov/media-library-data/bd125e67fb2bd37f8d609cbd71b835ae/FEMA+National+Strategy+Recommendations+\(V4\).pdf](http://www.fema.gov/media-library-data/bd125e67fb2bd37f8d609cbd71b835ae/FEMA+National+Strategy+Recommendations+(V4).pdf)).

FEMA. 2014a. "About the Agency." Retrieved March 28, 2014 (<http://www.fema.gov/about-agency>).

FEMA. 2014b. "About the National Flood Insurance Program." Retrieved April 26, 2014 (https://www.floodsmart.gov/floodsmart/pages/about/nfip_overview.jsp).

FEMA. 2014c. "Flood Insurance Reform." Retrieved April 26, 2014 (<http://www.fema.gov/flood-insurance-reform>).

FEMA. 2014d. "Homeowner Flood Insurance Affordability Act: Overview." Retrieved April 26, 2014 (http://www.fema.gov/media-library-data/13965519355974048b68f6d695a6eb6e6e7118d3ce464/HFIAA_Overview_FINAL_03282014.pdf).

FEMA. 2014e. "Sandy Recovery Improvement Act of 2013." Retrieved April 28, 2014 (<https://www.fema.gov/about-agency/sandy-recovery-improvement-act-2013>).

Ferreira, Marcus, Christine Bell, Katherine Nosker, Michael Yaffe, Michael D'Orazio, Kyle Davis, Albert Macaulay, Zhuosi (Joyce) Lu, and Brian Gibbons 2012. *Adapting to Climate Change in Coastal Monmouth County*. Retrieved August 20, 2014 (<http://policy.rutgers.edu/academics/projects/studios/monmoth12.pdf>).

Ferris, Elizabeth, Daniel Petz, and Chareen Stark. 2013. *The Year of Recurring Disasters: A Review of Natural Disasters in 2012*. Retrieved January 2014 (http://www.brookings.edu/~media/research/files/reports/2013/03/natural-disasters-review/brookings_review_natural_disasters_2012.pdf).

Field, A.P. 2005. *Discovering Statistics using SPSS*. (2nd edition). London: Sage.

Fothergill, Alice and Lori Peek. 2012. *Permanent Temporariness: Displaced Children in Louisiana*, Edited by L. Weber and L. Peek. Austin: University of Texas Press.

Fraser, James, Rebecca Elmore, David Godschalk and William Rohe. 2003. "Implementing Floodplain Land Acquisition Programs in Urban Localities " The Center for Urban & Regional Studies, University of North Carolina at Chapel Hill FEMA.

- Freudenburg, William, Robert Gramling, Shirley Laska and Kai Erikson. 2011. *Catastrophe in the Making: The Engineering of Katrina and the Disasters of Tomorrow*. Washington, D.C.: Island Press.
- Gibbons, Shannon, and Edward J. Ruddell. 1995. "The Effect of Goal Orientation and Place Dependence on Select Goal Interferences among Winter Backcountry Users." *Leisure Sciences* 17:171–83.
- Green, Rebekah, Scott Miles, Gala Gulacsik and Jason Levy. 2008. "Business Recovery Related to High-Frequency Natural Hazard Events." Quick Response Report. Natural Hazards Center: University of Colorado.
- Green, Timothy and Robert Olshansky. 2012. "Rebuilding Housing in New Orleans: The Road Home Program after the Hurricane Katrina Disaster ". *Housing Policy Debate* 22(1):75-99.
- Gregory, Kia. 2013. "Deciding Whether It's Lights Out." *The New York Times*. Retrieved March 10, 2014 (<http://www.nytimes.com/2013/10/27/nyregion/deciding-whether-its-lights-out.html?pagewanted=all>).
- Gutis, Philip. 1986. "If You're Thinking of Living in Great Kills." *The New York Times*. Retrieved October 10, 2014 (<http://www.nytimes.com/1986/01/12/realestate/if-you-re-thinking-of-living-in-great-kills.html>).

Haas, John Eugene, Robert W. Kates and Martyn J. Bowden. 1977. *Reconstruction Following Disaster*. Cambridge, Massachusetts: MIT Press.

Haplin, Stephanie. 2014. "Hurricane Sandy - FEMA IHP Individual and Household Program." Retrieved March 28, 2014 ([https://njdatabank.newark.rutgers.edu/sites/default/files/files/Report%20%20NJDataBank%20-%20Sandy%20-%206%20Feb%2013\(2\).pdf](https://njdatabank.newark.rutgers.edu/sites/default/files/files/Report%20%20NJDataBank%20-%20Sandy%20-%206%20Feb%2013(2).pdf)).

Hidalgo, M. Carmen, and Bernardo Hernandez. 2001. "Place Attachment: Conceptual and Empirical Questions." *Journal of Environmental Psychology* 21:273–81.

Holbrook, Allyson L., Melanie C. Green, and Jon A. Krosnick. 2003. "Telephone versus Face-to-Face Interviewing of National Probability Samples with Long Questionnaires: Comparisons of Respondent Satisficing and Social Desirability Response Bias." *The Public Opinion Quarterly* 67:79–125.

Hsieh, Hsiu-Fang and Sarah Shannon. 2005. "Three Approaches to Qualitative Content Analysis." *Qualitative Health Research* 15(9):1277-88.

HUD. 2012. "Disaster Recovery." Retrieved April 20, 2014 (http://portal.hud.gov/hudportal/documents/huddoc?id=cdbg_bas_20.pdf).

HUD. 2014a. "About HUD: Mission." Retrieved April 20, 2014 (<http://portal.hud.gov/hudportal/HUD?src=/about/mission>).

- HUD. 2014b. "Sandy Damage Estimates by Block Group." Retrieved October 10, 2014 (http://www.huduser.org/maps/map_sandy_blockgroup.html).
- Huq, Saleemul, Sari Kovats, Hannah Reid and David Satterthwaite. 2007. "Editorial: Reducing Risks to Cities from Disasters and Climate Change Environment and Urbanization." *Environment and Urbanization* 19(1):3-15.
- Institute for Digital Research and Education. 2014. "Annotated SPSS Output: Factor Analysis." UCLA. Retrieved October 30, 2014 (<http://www.ats.ucla.edu/stat/spss/output/factor1.htm>)
- Iowa Bureau of Homeland Security. 2014. "New 2014 Fiscal Year and Calendar Year Federal Thresholds for Recovery." Retrieved March 28, 2014 (<http://www.bhs.idaho.gov/Pages/Operations/DisasterAssistance/PDF/Disaster%20Thresholds.pdf>).
- Irvine, Annie. 2011. "Duration, Dominance and Depth in Telephone and Face-to-Face Interviews: A Comparative Exploration." *International Journal of Qualitative Methods*. 10(3):202-220.
- Iuchi, Kanako. 2010. "Reducing Vulnerabilities through Resettlement Planning in Disaster-Affected Communities: Relocation or Repopulation?" *Tipping Points in Humanitarian Crisis: From Hot Spots to Hot Systems*. United Nations University: Institute for Environment and Human Security.

- Hayes, Thomas and Andrew Neal. 2011. "Actuarial Rate Review: In Support of the Recommended October 1, 2011, Rate and Rule Changes." Retrieved April 8, 2014 (http://www.fema.gov/media-library-data/20130726-1809-250456893/actuarial_rate_review2011.pdf).
- Hidalgo, M. Carmen, and Bernardo Hernandez. 2001. "Place Attachment: Conceptual and Empirical Questions." *Journal of Environmental Psychology* 21:273–81.
- Jacobson, Louis. 2012. "After the Deluge: Cities along the Susquehanna River Prepare for the Next Big Flood." *Planning* 78(2):19-21.
- Johnson, Laurie. 1999. "Empowering Local Governments in Disaster Recovery Management: Lessons from Watsonville and Oakland in Recovering From The 1989 Loma Prieta Earthquake and Other Recent Disasters." *Mass Emergencies* 3:23-40.
- Jordan, Lawrence, Alfred Marcus, and Leo Reeder. "Response Styles in Telephone and Household Interviewing: A Field Experiment." *Public Opinion Quarterly* 44(2):210-222.
- Jorgensen, Bradley S., and Richard C. Stedman. 2001. "Sense of Place as an Attitude: Lakeshore Owners Attitudes toward Their Properties." *Journal of Environmental Psychology* 21:233–48.

- Kasarda, John D, and Morris Janowitz. 1974. "Community Attachment in Mass Society." *American Sociological Review* 39(3):328-339.
- Kenward, Alyson, Daniel Yawitz, and Urooj Raja. 2013. "Sewage Overflows From Hurricane Sandy." Retrieved April 2014 (<http://www.climatecentral.org/pdfs/Sewage.pdf>).
- Kirschenbaum, Alan. 1996. "Residential Ambiguity and Relocation Decisions: Population and Areas at Risk." *International Journal of Mass Emergencies and Disasters* 14(1):79-96.
- Kirschenbaum, Alan. 2005. "Preparing For the Inevitable: Environmental Risk Perceptions And Disaster Preparedness." *International Journal of Mass Emergencies and Disasters* 23(2):97-127.
- Knafo, Saki, and Lila Shapiro. 2012. "Staten Island's Hurricane Sandy Damage Sheds Light On Complicated Political Battle." *Huffington Post*. Retrieved October 10, 2014 (http://www.huffingtonpost.com/2012/12/06/staten-island-hurricane-sandy_n_2245523.html).
- Kowsh, Kate. 2013. "Sandy Buyout Offer: 169 on Staten Island Say Yes." *NY Post*. Retrieved March 10, 2014 (<http://nypost.com/2013/02/26/sandy-buyout-offer-169-on-staten-island-say-ye/>).

- Kraft, M. E., & Furlong, S. R. (2009). *Public Policy: Politics, Analysis, and Alternatives*. (3rd edition.). Washington, D.C.: CQ Press.
- Lewis, David. 2012. "The Relocation of Development From Coastal Hazards Through Publicly Funded Acquisition Programs: Examples and Lessons From the Gulf Coast." *Sea Grant Law and Policy Journal* 5(1):98-139.
- Lindell, Michael and Seong Hwang. 2008. "Households' Perceived Personal Risk and Responses in a Multihazard Environment." *Risk Analysis* 28(2):539-556.
- Lofland, John, David Snow, Leon Anderson and Lyn Lofland. 2005. *Analyzing Social Settings: A Guide to Qualitative Observation and Analysis*. Boston. Wadsworth Publishing.
- Lonergan, Steve. 1998. "The Role of Environmental Degradation in Population Displacement." Environmental Change and Security Project report 5–15.
- Lundrigan, Margaret. 2004. *Staten Island: Isle of the Bay*. Mount Pleasant: Arcadia Publishing.
- Mader, George G., W. E. Spangle, M. L. Blair, R. L. Meehan, S. W. Bilodeau, H. J. Degenkolb, G. S. Duggar and N. Williams, Jr. 1980. *Land Use Planning after Earthquakes*. Portola Valley, CA. William Spangle and Associates, Inc.

McCann, Monica. 2006. "Case Study of Floodplain Acquisition/Relocation Project in Kinston, NC after Hurricane Fran (1996) and Hurricane Floyd (1999)." Master's thesis, University of North Carolina Chapel Hill.

McCarthy, Francis. 2011. "Federal Stafford Act Disaster Assistance: Presidential Declarations, Eligible Activities, and Funding." Congressional Research Service. Retrieved April 9, 2014 (<https://www.fas.org/sgp/crs/homesec/RL33053.pdf>).

McCay, Bonnie, Debbie Mans, Satsuki Takahashi, and Sheri Seminski. 2005. "Public Access and Waterfront Development in New Jersey: From the Arthur Kill to the Shrewsbury River." Retrieved March 2013 (<http://www.nynjbaykeeper.org>).

McDowell, Christopher. 2002. "Involuntary Resettlement, Impoverishment Risks, and Sustainable Livelihoods." *The Australasian Journal of Disaster and Trauma Studies* 2002(2).

McLeman, R., and B. Smit. 2006. "Migration as an Adaptation to Climate Change." *Climatic Change* 76:31–53.

McMillan, David W., and David M. Chavis. 1986. "Sense of Community: A Definition and Theory." *Journal of Community Psychology* 14:6–23.

- Menoni, S. and G. Pesaro. 2008. "Is Relocation a Good Answer to Prevent Risk? Criteria to Help Decisionmakers Choose Candidates for Relocation in Areas Exposed to High Hydrogeological Hazards." *Disaster Prevention and Management*, 17:33-53.
- Miethe, Terrance, and Jane Gauthier. 2008. *Simple Statistics: Applications in Social Research*. New York: Oxford University Press.
- Mileti, Dennis and Eve Passerini. 1996. "A Social Explanation of Urban Relocation after Earthquakes." *International Journal of Mass Emergencies and Disasters* 14(1):97-110.
- Mileti, Dennis and J. Sorensen. 1988. Why People Take Precautions Against Natural Disasters? Pp. 68-83 in *Taking Care: Why People Take Precautions*. Edited by N. Weinstein. Cambridge, MA: Cambridge University Press.
- Mileti, Dennis. 1999. *Disasters by Design*. Washington, D.C.: Joseph Henry Press.
- Miller, D. and J. Rivera. 2007. "Landscapes of Disaster and Place Orientation in the Aftermath of Hurricane Katrina." Pp. 141–54 in *The Sociology of Katrina: Perspectives on a Modern Catastrophe*. Lanham, MD: Rowman & Littlefield.
- Molotch, Harvey. 1976. "The City as a Growth Machine: Toward a Political Economy of Place." *American Journal of Sociology* 82(2):309-32.

- Monmouth County. 2005. "Monmouth Beach: Tax Duplicate Books." Monmouth County Archives. Retrieved January 10, 2014 (<http://co.monmouth.nj.us/PrintPage.aspx?Id=3376>).
- Monmouth Plus. 2001. "Borough of Sea Bright." Retrieved October 10, 2014 (<http://www.monmouthplus.com/sea-bright.html>).
- Morrow-Jones, Hazel and Charles Morrow-Jones. 1991. "Mobility Due to Natural Disaster: Theoretical Considerations and Preliminary Analyses ". *Disasters* 15(2):126-32.
- Moskowitz, Harvey. 1989. Sea Bright Master Plan - 1989. Retrieved February 20, 2014 (<http://seabrightrc.org/vision-board-5/>).
- Mueller, Elizabeth, Holly Bell, Beth Chang and John Henneberger. 2011. "Looking for Home After Katrina: Postdisaster Housing Policy and Low-Income Survivors." *Journal of Planning Education and Research* 31(3):291-307.
- Myers, Candice, Tim Slack and Joachim Singelmann. 2008. "Social Vulnerability and Migration in the Wake of Disaster: The Case of Hurricanes Katrina and Rita." *Popular Environment* 29:271-91.
- Neff, James, and Robert Constantine. 1979. "Community Dissatisfaction and Perceived Residential Alternatives: An Interactive Model of the Formulation of Migration Plans." *Journal of Population* 2(1):18-32.

New York City. 2014. "The Staten Island Bluebelt: A Natural Solution to Stormwater Management." Retrieved September 2014

(http://www.nyc.gov/html/dep/html/dep_projects/bluebelt.shtml).

New York Rising. 2013. "New York Rising Community Reconstruction Program: East and South Shore Staten Island Conceptual Plan." Retrieved January 25, 2014 (http://stormrecovery.ny.gov/sites/default/files/crp/community/documents/staten_island_conceptual_plan.pdf).

Newman, Jessica Don Des Jarlais, Charles Turner, Jay Gribble, Phillip Cooley, and Denise Paone. 2002. "The Differential Effects of Face-to-Face and Computer Interview Modes." *American Journal of Public Health* 92:294–97.

Nigg, Joanne. 1995. "Disaster Recovery as a Social Process." Pp. 81-93 in *Wellington After the 'Quake': The Challenge of Rebuilding Cities*. Wellington, New Zealand: The Earthquake Commission.

Nigg, Joanne. 2013. "Personal Communication."

Norris, Fran and Stanley Murrell. 1988. "Prior Experience as a Moderator of Disaster Impact on Anxiety Symptoms in Older Adults." *American Journal of Community Psychology* 16(5):665-83.

Novick, Gina. 2008. "Is There a Bias against Telephone Interviews in Qualitative Research?" *Research in Nursing and Health* 31:391–98.

- Oliver-Smith, Anthony. 1991. "Successes and Failures in Post-Disaster Resettlement." *Disasters* 15(1):105-26.
- Oliver-Smith, Anthony. 1996. "Anthropological Research on Hazards and Disasters." *Annual Review of Sociology*. 25:303-28.
- Oliver-Smith, Anthony. 2010. "Catastrophe Readiness and Response: Mass Relocation." FEMA.
- Olshansky, Robert B. 2005. "How Do Communities Recover from Disaster? a Review of Current Knowledge and an Agenda for Future Research." Paper presented at the 46th Annual Conference of the Association of Collegiate Schools of Planning, Kansas City, October.
- Padree, Jessica. 2012. *Living through Displacement: Housing Insecurity among Low-Income Evacuees*, Edited by L. Weber and L. Peek. Austin: University of Texas Press.
- Palacio, Joseph. 1982. *Posthurricane Resettlement in Belize*. Edited by A. Oliver-Smith. Santa Fe and London: SAR Press.
- Partridge, William. 1989. "Involuntary Resettlement in Development Projects ". *Journal of Refugee Studies* 2(3):373-84.
- Patton, Michael. 2002. *Qualitative Research and Evaluation Methods*. Thousand Oaks: Sage Publications.

- Paul, Bimal, Deborah Che, Mitchel Stimers and Sohini Dutt. 2007. "'Disaster in Kansas': The Tornado in Greensburg." Natural Hazards Center, Institute of Behavioral Science, University of Colorado at Boulder, Boulder
- Peacock, Walter, Betty Morrow and Hugh Gladwin. 1997. "Hurricane Andrew: Ethnicity, Gender and the Sociology Of Disasters." Laboratory for Social and Behavioral Research: Florida International University.
- Perch-Nielsen, Sabine L., Michèle B. Bättig, and Dieter Imboden. 2008. "Exploring the Link between Climate Change and Migration." *Climatic Change* 91:375–93.
- Perry, Ronald and Michael K. Lindell. 1997. "Principles for Managing Community Relocation as a Hazard Mitigation Measure." *Contingencies and Crisis Management* 45(1):49-59.
- Perry, Ronald and Alvin Mushkatel. 1984. *Disaster Management: Warning Response and Community Relocation*. Westport: Quorum Books.
- Phillips, Brenda. 2009. *Disaster Recovery*. Philadelphia: Taylor and Francis Group.
- Prater, Carla and Michael Lindell. 2000. "The Politics of Hazard Mitigation." *Natural Hazards Review*. 1(2):73-82.
- Pretty, Grace, Chipuer, Heather and Paul Bramston. 2003. "Sense of Place Amongst Adolescents and Adults in Two Rural Australian Towns: The Discriminating

Features of Place Attachment, Sense of Community and Place Dependence in Relation to Place Identity.” *Journal of Environmental Psychology*. 23(3):273-287.

Quarantelli, E.L. 1999. "The Disaster Recovery Process: What We Know and Do Not Know from Research." Disaster Research Center: University of Delaware.

Raymond, Christopher, Brown, Gregory, and Delene Weber. (2010). “The Measurement of Place Attachment: Personal, Community, and Environmental Connections.” *Journal of Environmental Psychology*. 30(4):422–434.

Reuveny, Rafael. 2007. “Climate Change-Induced Migration and Violent Conflict.” *Political Geography* 26:656–73.

Reynolds, Joe. 2009. “Wild Waves Slam the Jersey Shore.” *Atlantic Highlands Herald*. Retrieved October 10, 2014 (<http://www.ahherald.com/columns-list/old-oak-trail/7463-wild-waves-slam-the-jersey-shore>).

Riad, Jasmin and Fran Norris. 1996. “The Influence of Relocation on the Environmental, Social, and Psychological Stress Experienced by Disaster Victims.” *Environment and Behavior*. 28(2):163–182.

Rubin, Claire and Daniel Barbee. 1985. "Disaster Recovery and Hazard Mitigation: Bridging the Intergovernmental Gap." *Public Administration Review* 45:57-63.

- Rubin, Claire, Martin Saperstein and Daniel Barbee. 1985. *Community Recovery from a Major Natural Disaster*. University of Colorado.
- Rubin, Claire. 2009. "Long Term Recovery from Disasters – The Neglected Component of Emergency Management." *Journal of Homeland Security and Emergency Management* 6(1).
- Saldana, Johnny. 2012. *The Coding Manual for Qualitative Researchers*: Sage Publications.
- Sastry, Narayan. 2009. "Displaced New Orleans Residents in the Aftermath of Hurricane Katrina: Results from a Pilot Survey." *Organ Environment* 22(4):395-409.
- SBA. 2014. "About SBA: What We Do." Retrieved April 27, 2014 (http://www.sba.gov/about-sba/what_we_do/history).
- Schneider, A., & Ingram, H. 1990. "Behavioral Assumptions of Policy Tools." *The Journal of Politics*, 52(2):510-529.
- Schramm, Wilbur. 1971. "Notes on Case Studies of Instructional Media Projects." Stanford University, California Institute for Communication Research, Working Paper for Academy of Educational Development.
- Scudder, Thayer and Elizabeth Colson. 1982. *Welfare to Development: A Conceptual Framework for the Analysis of Dislocated People*, Edited by A. Oliver-Smith. Santa Fe and London: SAR Press.

- Semken, Steven, Jennifer J. Neakrase, Rebecca Escobar Dial, and Dale R. Baker. 2009. "Factors That Influence Sense of Place as a Learning Outcome and Assessment Measure of Place-Based Geoscience Teaching." *Electronic Journal of Science Education* 13(2).
- Shaw, Judith and Iftekhar Ahmed. 2010. "Design and Delivery of Post-Disaster Housing Resettlement Programs." Monash University Royal Melbourne Institute of Technology (RMIT).
- Shriver, Thomas and Dennis Kennedy. 2005. "Contested Environmental Hazards and Community Conflict over Relocation." *Rural Sociology*. 70(4):491-513.
- SINY. 2014. "About Oakwood, Staten Island." *Trending SINY*. Retrieved October 10, 2014 (<http://www.realestatesiny.com/About-Oakwood-Staten-Island-NY.php>).
- Slovic, Paul. 1987. "Perception of Risk." *Science*. 236:280–285.
- Slovic, Paul. 1999. "Trust, Emotion, Sex, Politics, and Science: Surveying the Risk-Assessment Battlefield." *Risk Analysis*. 19(4):689-701.
- Smith, David and J.W. Handmer. 1986. *Flood Warning in Australia: Policies, Institutions and Technology*. Centre for Resource and Environmental Studies, Australian National University: Canberra.
- Smith, Gavin and Dennis Wenger. 2007. Sustainable Disaster Recovery: Operationalizing an Existing Agenda. Pp. 234-57 in *Handbook of Disaster*

Research, edited by H. Rodriguez, E. Quarantelli and R. Dynes. New York: Springer.

Smith, Gavin. 2011. "Planning for Post-Disaster Recovery: A Review of the United States Disaster Assistance Framework." Paper presented at the PERI Symposium: Community Recovery from Disaster.

Spahr, Rob. 2012. "Hurricane Sandy Aftermath Photos: Sea Bright Residents Return Home to Devastation, but Also Progress." *NJ.com*. Retrieved October 10, 2014 (http://www.nj.com/monmouth/index.ssf/2012/11/hurricane_sandy_aftermath_photos_sea_bright_residents_return_home_to_devastation_but_also_progress.html).

Speare, A. Jr. 1974. "The Relevance of Models of Internal Migration for the Study of International Migration." in *International Migration Proceedings of a Seminar on Demographic Research in Relation to International Migration Paris*.

Spoto, MarryAnn, and Jarrett Renshaw. 2013. "Hurricane Sandy Deals Big Blow to N.J. Towns' Property Tax Rolls." *NJ.com*. Retrieved October 10, 2014 (http://www.nj.com/politics/index.ssf/2013/03/hurricane_sandy_deals_blow_to.html).

Stallings, Robert and E. L. Quarantelli. 1985. "Emergent Citizen Groups and Emergency Management." *Public Administration Review*. 45:93-100.

Starkweather, Jon and Richard Herrington. 2014. "Research and Statistical Support."

University of North Texas. Retrieved October 30, 2014

(http://www.unt.edu/rss/class/Jon/SPSS_SC/Module9/M9_FA/SPSS_M9_FA1.htm)

State of New Jersey. 2013. "Christie Administration Announces \$50 Million In Federal Hazard Mitigation Program Grants To Help Protect Communities Against Future Disasters." Governor's Office of Recovery and Rebuilding. Retrieved April 28, 2014

(<http://nj.gov/governor/news/news/552013/approved/20131008a.html>).

State of New Jersey. 2014a. "Recovery Initiatives." Governor's Office of Recovery and Rebuilding." Retrieved April 18, 2014

(<http://www.nj.gov/gorr/plan/index.html#hap>).

State of New Jersey. 2014b. *State of New Jersey 2014 Hazard Mitigation Plan*.

Retrieved April 18, 2014

(<http://www.ready.nj.gov/programs/pdf/mitigation2014/2014-Section-5-2.pdf>).

State of New York. 2013a. "About the New York State Community Development Block Grant Disaster Recovery (CDBG-DR) Program." Retrieved April 28, 2014 (<http://stormrecovery.ny.gov/action-plans-and-amendments>).

State of New York. 2013b. "Governor Cuomo Announces Over \$500 Million in Hazard Mitigation Grants to Rebuild Stronger, Resilient Communities

Impacted by Recent Natural Disasters.” Retrieved April 28, 2014
(<http://www.governor.ny.gov/press/06102013cuomo-announces-500mil-hazard-mitigation-natural-disasters>).

State of New York. 2013c. “Hazard Mitigation Grant Program (HMGP).” Retrieved April 28, 2014 (<http://stormrecovery.ny.gov/content/hazard-mitigation-grant-program-hmcp-0>).

State of New York. 2013d. “Storm Recovery: Overview.” Retrieved April 28, 2014 (<http://stormrecovery.ny.gov/overview>).

State of New York 2014. January 1, 2014 Thru March 31, 2014 Performance Report. Retrieved December 18, 2014 (http://stormrecovery.ny.gov/sites/default/files/uploads/qpr_q1_2014_-_sandy_-_final_approved.pdf).

Stone, D. 2002. *Policy Paradox: The Art of Political Decision Making*. New York: W. W. Norton & Company.

Sturges, Judith and Kathleen Hanrahan. 2004. “Comparing Telephone and Face-to-Face Qualitative Interviewing: a Research Note.” *Qualitative Research* 4: 107-118.

The Borough of Sea Bright, New Jersey. 2014a. “Sea Bright.” Retrieved October 10, 2014 (<http://seabrightnj.org/beach/history>).

- The Borough of Sea Bright, New Jersey. 2014b. Article V: Provisions for Flood Hazard Reduction. Retrieved November 29, 2014 (<http://ecode360.com/8055968>.)
- Tierney, Kathleen, and Xuewen Sheng. 2001. "Explaining Support for Seismic Loss-Reduction Measures: Data From a Household Survey." Retrieved February 20, 2013 (<http://udspace.udel.edu/bitstream/handle/19716/12854/PP320a.pdf?sequence=1>).
- Tobin, Graham. 1992. "Community Response to Floodplain Relocation in Soldiers Grove, Wisconsin." *Transactions of the Wisconsin Academy of Sciences, Arts and Letters* 80:87-96.
- Trainor, Joseph. 2008. "Extreme Occasions as Organizational Context: A Contingency Perspective on FEMA's 'Fit' During the Response to Katrina." Dissertation. University of Delaware.
- Turner, Ralph H., Joanne M. Nigg, and Denise H. Paz. 1986. *Waiting for Disaster: Earthquake Watch in California*. Berkeley: University of California Press.
- United States Census Bureau. 2010. "Demographic Data." Retrieved October 10, 2014 (<http://www.census.gov/>).
- Vale, Lawrence and Thomas Campanella. 2005. *The Resilient City: How Modern Cities Recover from Disaster*. Oxford: Oxford University Press.

Weber, Lynn and Lori Peek. 2012. *Displaced: Life in the Katrina Diaspora*. Austin: University of Texas Press.

White, Dave D., Randy J. Virden, and Carena J. Van Riper. 2008. "Effects of Place Identity, Place Dependence, and Experience-Use History on Perceptions of Recreation Impacts in a Natural Setting." *Environmental Management* 42:647–57.

Wijck, Esther, Johanna Bosch, and Maria Hunink. 1998. "Time-tradeoff Values and Standard-gamble Utilities Assessed during Telephone Interviews versus Face-to-face Interviews." *Medical Decision-Making* 18:400-405.

Williams, Daniel and Jerry Vaske. 2003. "The Measurement of Place Attachment: Validity and Generalizability of a Psychometric Approach. *Forest Science* 49(6):830-840.

Williams, Daniel, Michael Patterson, Joseph Roggenbuck, and Alan Watson. 1992. "Beyond the Commodity Metaphor: Examining Emotional and Symbolic Attachment to Place." *Leisure Sciences* 14:29–46.

Wilson, Rick and Robert Stein. 2006. "Katrina Evacuees in Houston: One-Year Out." National Science Foundation. Retrieved October 9, 2013 (http://brl.rice.edu/Katrina/White_Papers/White_Paper_9_8_06.pdf)

Wolpert, Julian. 1966. "Migration as an Adjustment to Environmental Stress." *Journal of Social Issues* 22(4):92-102.

Yin, Robert. 2009. *Case Study Research: Design and Methods*. Thousand Oaks: Sage Publications.

APPENDIX
Appendix A
ACRONYMS

Table 33: Acronyms

Acronym	Meaning	Page
CDBG	Community Development Block Grant	12
CDBG-DR	Community Development Block Grant-Disaster Recovery	100
FEMA	Federal Emergency Management Agency	12
FHA	Federal Housing Administration	115
FIA	Federal Insurance Administration	124
FIRA	Flood Insurance Reform Act	125
FIRM	Flood Insurance Rate Map	122
GDP	Gross Domestic Product	13
HFIA	Homeowner Flood Insurance Affordability Act	133
HMGP	Hazard Mitigation Grant Program	12
HUD	U.S. Department of Housing and Urban Development	12
IA	Individual Assistance	122
IRB	Institutional Review Board	84
IRLR	Impoverishment Risks and Livelihood Reconstruction Model	20
LMI	Low-to-Moderate Income	129
NDHS	National Disaster Housing Strategy	111

NDRF	National Disaster Recovery Framework	119
NFiP	National Flood Insurance Program	122
NGO	Non-Governmental Organization	63
PA	Public Assistance	130
PAS	Program Administration by States	132
PRE	Proportional Reduction in Error	72
RREM	Rehabilitation, Reconstruction, Elevation and Mitigation	134
RSF	Recovery Support Function	119
SBA	Small Business Administration	81
SFHA	Special Flood Hazard Area	125
SPSS	Statistical Package for the Social Sciences	69
SRIA	Sandy Recovery Improvement Act	131
USDA	U.S. Department of Agriculture	110
USPS	United States Postal Service	60

Appendix B

INTERVIEW GUIDE FOR RESIDENTS

POST-DISASTER RESETTLEMENT INTERVIEW GUIDE FOR RESIDENTS

Interviewer: _____

Contact Information: _____

Interviewee: _____

Contact Information: _____

Date: _____

Start Time: _____

End Time: _____

Research question for this interview guide: How do families make residential decisions following disaster?

Sub-questions: What factors are present, and distinguish them from families that do not decide to move (to answer this half I would have to interview someone who decided not to move)? What is the process? What factors do they rank as important? How do they understand their own hazard exposure?

Probes for reference

- Could you say more about that?
- What did you mean by...?
- How did your family feel about...?
- How do you think the rest of your community would feel about...?
- Just to make sure I understand, could you summarize what you just said for me?

Introduction

- Thanks for time
- Explanation of project
- Assurance of confidentiality, overview of informed consent and request to start recording
- Any questions?

Introductory Questions: General inquiries and life pre-Sandy

So what I am generally interested in is household recovery following Hurricane Sandy. First though I want to start by getting a better understanding of your community. There are no right or wrong answers.

1. Tell me about [Sea Bright/Oakwood Beach].
 - a. What's it like living there?
 - b. Changes pre/post Sandy?
 - c. Could you talk about the community leadership?
2. Now I'd like to talk about your household's experiences with Hurricane Sandy. Could you describe that for me?
 - a. How did you go about [getting your home repaired/selling your property]? Could you describe that process?
 - b. Did you ever move?
 - i. Where did you stay?
 1. How long were you there?
 2. What prompted you to leave?
3. I know that after disasters families have many tough decisions to make. You have many options to weigh when ultimately deciding where you want to live. Some families decided to stay in the area, and others decided to move. What motivated you to [rebuild/move]? Try to think back for me and give me the step by step process.
 - a. How long do you think you'll stay at your current residence?
 - i. What makes you think that?
 - ii. Do you feel safe there?
4. Let me create a hypothetical situation for a second. I know you decided to [move/rebuild] after the storm, but what do you think would have happened if you decided to [move/rebuild]?
5. Let me have you step back and think about housing recovery in the community of [Sea Bright/Oakwood Beach]. What could be done to speed up recovery for homeowners?
 - a. What about for renters?
6. If you were me, who would you interview next?
7. Thank you for your time and assistance. What questions didn't I ask you that I should have?

I want to repeat how much I really appreciate your time. Your perspective on the issue was very enlightening, and I have learned so much from you.

Appendix C

INTERVIEW GUIDE FOR POLICYMAKERS

POST-DISASTER RESETTLEMENT INDIVIDUALS INVOLVED IN THE DEVELOPMENT OF POLICY INTERVIEW GUIDE

Interviewer: _____
Contact Information: _____
Interviewee: _____
Contact Information: _____
Date: _____
Start Time: _____
End Time: _____

Research question for this interview guide: How do families decide that resettling is a better option than rebuilding?

Sub-questions: What factors are present, and distinguish them from families that do not decide to move (to answer this half I would have to interview someone who decided not to move)? What is the process? What factors do they rank as important? How do they understand their own hazard exposure?

Probes for reference

- Could you say more about that?
- What did you mean by...?
- How did your family feel about...?
- How do you think the rest of your community would feel about...?
- Just to I make sure I understand, could you summarize what you just said for me?

Introduction

- Thanks for time
- Assurance of confidentiality, overview of informed consent and request to start recording
- Explanation of project
I am a PhD student working on my dissertation, investigating housing decision-making following Hurricane Sandy. In general, I am interested in how households are making housing decisions after Hurricane Sandy. I'm looking

at two communities as case studies, Sea Bright, NJ, and Oakwood Beach, NY. To provide context for those decisions, I'm interviewing policymakers and other involved in the implementation of policy. I'm focusing on the responsibilities of your organization, how you work with other groups on these issues, your relationship with the public, and how you measure outcomes, all in the context of housing recovery. There is no right or wrong answer here, and this isn't an evaluation, I'm simply interested in perspectives.

- Any questions?

I would like to start by talking about your organization and relations with other organizations.

1. Could you tell me about what your organization does in housing recovery?
 - a. What kinds of programs did you provide?
 - b. What specific policies address housing recovery?
2. Tell me about who you work with on housing recovery. Who's at the table?
 - a. Could you tell me about how what you do in housing recovery connects to what other organizations do?
 - b. You've talked a lot about working with X (government or NGO), what about your work with Y (government or NGO)?
 - c. Has coordination gone well, or was there any conflict? Problems in communication?

Now I'd like to shift focus a bit and talk about your organization's relationship with the public throughout this process.

3. I know there are many different factors your organization has to consider when deciding how to recover after a disaster. When you are making these decisions, how much input does the public have?
 - a. What methods did you use communicate with the public? Could I have a copy of any materials used?
 - b. What sort of priorities did the public express?

I'm also interested in outcomes, and how your organization defines success and failure.

4. How does your organization define a successful housing recovery?
 - a. How do you think this definition matches up with other organizations?
 - b. How do you think this definition matches up with the public?
 - c. How would you define failure?

Okay, considering what you said in your last response, let me create a hypothetical.

5. When you consider household recovery and what may've been missing, If you were given an unlimited budget, what would you create?

- a. Could you give me a specific instance you saw that made you think this kind of program would be successful?
- b. Who would run this organization?

Thank you so much for answering my questions. Since I have you here talking to me, I have just a few more to help direct the rest of my study.

6. If you were me, who would you interview next?
 - a. Is it okay if I tell them you recommended them, without mentioning that you participated in an interview?
7. Let me turn the tables here for a second. What questions didn't I ask you that I should have?
8. Lastly, we talked a lot about policies, programs, and communication with the public. Do you have any of those documents that you think would be helpful for me? Could you e-mail me a copy?

I want to repeat how much I really appreciate your time...

Appendix D

CASE STUDY RAW DATA

Table 34: Case Study Raw Data

	<u>Buyout</u> Oakwood Beach, NY		<u>Comparison</u> Sea Bright Borough, NJ	
	n	%	n	%
<i>Residential Data</i>				
<i>Do you own or rent the property addressed on the envelope of this survey?</i>				
<i>Rent</i>	4	7.4	30	9.9
<i>Own</i>	49	90.7	273	90.1
<i>Total</i>	53	98.1	303	100.0
<i>Missing</i>	1	1.9	-	-
<i>Which of the following describes how you use this property? Mark all that apply.</i>				
<i>Primary Residence</i>	49	90.7	155	51.2
<i>Second Home</i>	-	-	88	29.0
<i>Rental Property</i>	-	-	27	8.9
<i>Other</i>	-	-	4	1.3
<i>Prefer not to answer</i>	1	1.9	2	.7
<i>Total</i>	50	92.6	276	91.1
<i>Missing</i>	4	7.4	27	8.9
<i>How long has this residence been owned by your family? Please answer in years.</i>				
<i>Median (years)</i>	13		12	
<i>What type of home is this?</i>				
<i>Single-family home</i>	46	85.2	107	35.3
<i>Multi-family home</i>	2	3.7	12	4.0
<i>Apartment</i>	-	-	9	3.0
<i>Condo/Townhouse</i>	4	7.4	171	56.4
<i>Other</i>	2	3.7	4	1.3
<i>Total</i>	54	100	303	100.0
<i>Missing</i>	-	-	-	-
<i>When did you move into or take ownership of this house, apartment, or mobile home? Please provide the calendar year (for example, 2001).</i>				
<i>Median (year)</i>	2001		2002	

<i>In total, how many years have you lived in [Oakwood Beach/Sea Bright]?</i>			
<i>Median (years)</i>	13	13	

<i>Place identity and place attachment</i>				
<i>I feel [Oakwood Beach/Sea Bright] is a part of me.</i>				
<i>Strongly Agree</i>	18	33.3	111	36.6
<i>Agree</i>	13	24.1	119	39.3
<i>Neutral</i>	17	31.5	48	15.8
<i>Disagree</i>	3	5.6	8	2.6
<i>Strongly Disagree</i>	3	5.6	7	2.3
<i>Total</i>	54	100	293	96.7
<i>Missing</i>	-	-	10	3.3

<i>Being in [Oakwood Beach/Sea Bright] says a lot about whom I am.</i>				
<i>Strongly Agree</i>	7	13	76	25.1
<i>Agree</i>	21	38.9	103	34.0
<i>Neutral</i>	17	31.5	82	27.1
<i>Disagree</i>	6	11.1	25	8.3
<i>Strongly Disagree</i>	2	3.7	8	2.6
<i>Total</i>	53	98.1	294	97.0
<i>Missing</i>	1	1.9	9	3.0

<i>I am very attached to [Oakwood Beach/Sea Bright].</i>				
<i>Strongly Agree</i>	13	24.1	112	37.0
<i>Agree</i>	13	24.1	108	35.6
<i>Neutral</i>	19	35.2	57	18.8
<i>Disagree</i>	4	7.4	12	4.0
<i>Strongly Disagree</i>	4	7.4	4	1.3
<i>Total</i>	53	98.1	293	96.7
<i>Missing</i>	1	1.9	10	3.3

<i>No other place can compare to [Oakwood Beach/Sea Bright].</i>				
<i>Strongly Agree</i>	7	13	78	25.7
<i>Agree</i>	8	14.8	69	22.8
<i>Neutral</i>	18	33.3	88	29.0
<i>Disagree</i>	16	29.6	46	15.2
<i>Strongly Disagree</i>	4	7.4	14	4.6
<i>Total</i>	53	98.1	295	97.4
<i>Missing</i>	1	1.9	8	2.6

<i>[Oakwood Beach/Sea Bright] is the best place for what I like to do.</i>				
<i>Strongly Agree</i>	8	14.8	85	28.1

Agree	12	22.2	113	37.3
Neutral	19	35.2	76	25.1
Disagree	10	18.5	17	5.6
Strongly Disagree	4	7.4	5	1.7
Total	53	98.1	296	97.7
Missing	1	1.9	7	2.3

The things I do at [Oakwood Beach/Sea Bright] I would enjoy doing just as much at some similar community.

Strongly Agree	3	5.6	22	7.3
Agree	5	9.3	69	22.8
Neutral	16	29.6	88	29.0
Disagree	23	42.6	98	32.3
Strongly Disagree	6	11.1	18	5.9
Total	53	98.1	295	97.4
Missing	1	1.9	8	2.6

Place identity and place attachment [recoded]

I feel [Oakwood Beach/Sea Bright] is a part of me.

Agree	31	57.4	230	75.9
Neutral	17	31.5	48	15.8
Disagree	6	11.1	15	5.0
Total	54	100	293	96.7
Missing	-	-	10	3.3

Being in [Oakwood Beach/Sea Bright] says a lot about whom I am.

Agree	28	51.9	179	59.1
Neutral	17	31.5	82	27.1
Disagree	8	14.8	33	10.9
Total	53	98.1	294	97.0
Missing	1	1.9	9	3.0

I am very attached to [Oakwood Beach/Sea Bright].

Agree	26	48.1	220	72.6
Neutral	19	35.2	57	18.8
Disagree	8	14.8	16	5.3
Total	53	98.1	293	96.7
Missing	1	1.9	10	3.3

No other place can compare to [Oakwood Beach/Sea Bright].

Agree	15	27.8	147	48.5
Neutral	18	33.3	88	29.0

<i>Disagree</i>	20	37	60	19.8
<i>Total</i>	53	98.1	295	97.4
<i>Missing</i>	1	1.9	8	2.6

[Oakwood Beach/Sea Bright] is the best place for what I like to do.

<i>Agree</i>	20	37	198	65.3
<i>Neutral</i>	19	35.2	76	25.1
<i>Disagree</i>	14	25.9	22	7.3
<i>Total</i>	53	98.1	296	97.7
<i>Missing</i>	1	1.9	7	2.3

The things I do at [Oakwood Beach/Sea Bright] I would enjoy doing just as much at some similar community.

<i>Agree</i>	8	14.8	91	30.0
<i>Neutral</i>	16	29.6	88	29.0
<i>Disagree</i>	29	53.7	116	38.3
<i>Total</i>	53	98.1	295	97.4
<i>Missing</i>	1	1.9	8	2.6

Attachment indexed.

<i>Agree</i>	23	42.6	184	60.7
<i>Neutral</i>	18	33.3	83	27.4
<i>Disagree</i>	12	22.2	25	8.3
<i>Total</i>	53	98.1	292	96.4
<i>Missing</i>	1	1.9	11	3.6

Damage and insurance coverage

How much damage did your home sustain related to Hurricane Sandy? Please estimate in dollars.

<i>Mean</i>	\$66,744.38	\$92,639.53
-------------	-------------	-------------

Did you have flood insurance at the time that Hurricane Sandy occurred?

<i>No</i>	13	24.1	74	24.4
<i>Yes</i>	41	75.9	218	71.9
<i>Total</i>	54	100	292	96.4
<i>Missing</i>	-	-	11	3.6

What amount of this damage did flood insurance cover?

<i>Mean</i>	\$35,507.76	\$52,742.00
-------------	-------------	-------------

How extensive was the damage to your home due to Hurricane Sandy?

<i>No Damage</i>	3	5.6	20	6.6
<i>Not Very Extensive</i>	7	13	73	24.1
<i>Somewhat Extensive</i>	22	40.7	113	37.3

<i>Very Extensive</i>	22	40.7	93	30.7
<i>Total</i>	54	100	299	98.7
<i>Missing</i>	-	-	4	1.3

How extensive was the damage to [Oakwood Beach/Sea Bright] due to Hurricane Sandy?

<i>No Damage</i>	3	5.6	-	-
<i>Not Very Extensive</i>	2	3.7	3	1.0
<i>Somewhat Extensive</i>	3	5.6	10	3.3
<i>Very Extensive</i>	45	83.3	276	91.1
<i>Total</i>	53	98.1	289	95.4
<i>Missing</i>	1	1.9	14	4.6

Travel disruption

At any time did the disruption from Hurricane Sandy affect your ability to travel within [Oakwood Beach/Sea Bright] for everyday activities (go to work, church, the post office, the grocery store, etc.)?

<i>No</i>	12	22.2	30	9.9
<i>Yes</i>	41	75.9	260	85.8
<i>Total</i>	53	98.1	290	95.7
<i>Missing</i>	1	1.9	13	4.3

How long did the disruption from Hurricane Sandy affect your ability to travel within [Oakwood Beach/Sea Bright] for everyday activities (go to work, church, the post office, the grocery store, etc.)?

<i>Less than a week</i>	6	11.1	2	0.7
<i>Two to four weeks</i>	21	38.9	97	32.0
<i>Two to six months</i>	11	20.4	105	34.7
<i>Seven to twelve months</i>	2	3.7	31	10.2
<i>More than a year</i>	1	1.9	20	6.6
<i>Total</i>	41	75.9	255	84.2
<i>Skipped</i>	12	22.2	30	9.9
<i>Missing</i>	1	1.9	18	5.9

Did the disruption from Hurricane Sandy affect your ability to travel outside [Oakwood Beach/Sea Bright] at any time?

<i>No</i>	22	40.7	162	53.5
<i>Yes</i>	32	59.3	126	41.6
<i>Total</i>	54	100	288	95.0
<i>Missing</i>	-	-	15	5.0

How long did the disruption from Hurricane Sandy inhibit your ability to travel outside [Oakwood Beach/Sea Bright]?

<i>Less than a week</i>	4	7.4	25	8.3
<i>Two to four weeks</i>	18	33.3	44	14.5
<i>Two to six months</i>	9	16.7	40	13.2
<i>Seven to twelve months</i>	1	1.9	15	5.0
<i>More than a year</i>	-	-	4	1.3
<i>Total</i>	32	59.3	128	42.2
<i>Skipped</i>	22	40.7	162	53.5
<i>Missing</i>	-	-	13	4.3

Residential status

Do you still live in the same community as you did at the time of Hurricane Sandy?

<i>No</i>	22	40.7	32	10.6
<i>Yes</i>	31	57.4	262	86.5
<i>Total</i>	53	98.1	294	97.0
<i>Missing</i>	1	1.9	9	3.0

Do you still live at the same address as you did at the time of Hurricane Sandy?

<i>No</i>	23	42.6	43	14.2
<i>Yes</i>	31	57.4	250	82.5
<i>Total</i>	54	100	293	96.7
<i>Missing</i>	-	-	10	3.3

How long do you plan to live at your current residence?

<i>Less than one year</i>	11	20.4	27	8.9
<i>One to five years</i>	15	27.8	95	31.4
<i>More than five years</i>	26	48.1	164	54.1
<i>Total</i>	52	96.3	286	94.4
<i>Missing</i>	2	3.7	17	5.6

Committed [index variable – Committed=same community, plan to live at same address for greater than five years.]

<i>No</i>	39	72.2	126	41.6
<i>Yes</i>	12	22.2	156	51.5
<i>Total</i>	51	94.4	282	93.1
<i>Missing</i>	3	5.6	21	6.9

Investment [index variable]

<i>New community</i>	21	38.9	28	9.2
<i>Same community, less than 1 year</i>	9	16.7	15	5.0
<i>Same community, 1-5 years</i>	9	16.7	83	27.4
<i>Same community, more than 5 years</i>	12	22.2	156	51.5

<i>Total</i>	51	94.4	282	93.1
<i>Missing</i>	3	5.6	21	6.9
Buyout decision and reasoning				
<i>Were you offered money for your home (a buyout)?</i>				
<i>No</i>	20	37	-	-
<i>Yes</i>	34	63	-	-
<i>Total</i>	54	100	-	-
<i>Missing</i>	-	-	-	-
<i>Did you accept the [buyout] offer?</i>				
<i>No</i>	5	9.3	-	-
<i>Yes</i>	29	53.7	-	-
<i>Total</i>	34	63	-	-
<i>Skipped</i>	20	37	-	-
<i>Missing</i>	-	-	-	-
Variables affecting decision [how important was each element when making your decision about where to live after Hurricane Sandy]				
<i>The likelihood of a hurricane</i>				
<i>Not Important At All</i>	4	7.4	53	17.5
<i>Not Very Important</i>	5	9.3	66	21.8
<i>Somewhat Important</i>	8	14.8	115	38.0
<i>Very Important</i>	32	59.3	43	14.2
<i>Total</i>	49	90.7	277	91.4
<i>Missing</i>	5	9.3	26	8.6
<i>Concerns over sea level rise</i>				
<i>Not Important At All</i>	3	5.6	49	16.2
<i>Not Very Important</i>	3	5.6	58	19.1
<i>Somewhat Important</i>	9	16.7	106	35.0
<i>Very Important</i>	35	64.8	65	21.5
<i>Total</i>	50	92.6	278	91.7
<i>Missing</i>	4	7.4	25	8.3
<i>Being close to family</i>				
<i>Not Important At All</i>	5	9.3	54	17.8
<i>Not Very Important</i>	9	16.7	38	12.5
<i>Somewhat Important</i>	11	20.4	82	27.1
<i>Very Important</i>	25	46.3	101	33.3
<i>Total</i>	50	92.6	275	90.8
<i>Missing</i>	4	7.4	28	9.2

<i>Being close to friends</i>				
<i>Not Important At All</i>	7	13	42	13.9
<i>Not Very Important</i>	11	20.4	52	17.2
<i>Somewhat Important</i>	15	27.8	99	32.7
<i>Very Important</i>	18	33.3	82	27.1
<i>Total</i>	51	94.4	275	90.8
<i>Missing</i>	3	5.6	28	9.2
<i>Being close to employment opportunities</i>				
<i>Not Important At All</i>	4	7.4	94	31.0
<i>Not Very Important</i>	7	13	42	13.9
<i>Somewhat Important</i>	15	27.8	72	23.8
<i>Very Important</i>	23	42.6	65	21.5
<i>Total</i>	49	90.7	273	90.1
<i>Missing</i>	5	9.3	30	9.9
<i>Being close to the beach</i>				
<i>Not Important At All</i>	25	46.3	18	5.9
<i>Not Very Important</i>	14	25.9	20	6.6
<i>Somewhat Important</i>	6	11.1	90	29.7
<i>Very Important</i>	6	11.1	149	49.2
<i>Total</i>	51	94.4	277	91.4
<i>Missing</i>	3	5.6	26	8.6
<i>Access to affordable housing</i>				
<i>Not Important At All</i>	13	24.1	102	33.7
<i>Not Very Important</i>	4	7.4	59	19.5
<i>Somewhat Important</i>	13	24.1	64	21.1
<i>Very Important</i>	21	38.9	48	15.8
<i>Total</i>	51	94.4	273	90.1
<i>Missing</i>	3	5.6	30	9.9
<i>Family history in the area</i>				
<i>Not Important At All</i>	20	37	104	34.3
<i>Not Very Important</i>	12	22.2	57	18.8
<i>Somewhat Important</i>	8	14.8	64	21.1
<i>Very Important</i>	11	20.4	49	16.2
<i>Total</i>	51	94.4	274	90.4
<i>Missing</i>	3	5.6	29	9.6

<i>Opinions of neighbors</i>				
<i>Not Important At All</i>	15	27.8	115	38.0
<i>Not Very Important</i>	13	24.1	81	26.7
<i>Somewhat Important</i>	14	25.9	56	18.5
<i>Very Important</i>	9	16.7	21	6.9
<i>Total</i>	51	94.4	273	90.1
<i>Missing</i>	3	5.6	30	9.9
<i>Concerns about going into debt</i>				
<i>Not Important At All</i>	5	9.3	73	24.1
<i>Not Very Important</i>	4	7.4	59	19.5
<i>Somewhat Important</i>	17	31.5	75	24.8
<i>Very Important</i>	24	44.4	69	22.8
<i>Total</i>	50	92.6	276	91.1
<i>Missing</i>	4	7.4	27	8.9
<i>Changes in where homes can be built</i>				
<i>Not Important At All</i>	8	14.8	98	32.3
<i>Not Very Important</i>	11	20.4	70	23.1
<i>Somewhat Important</i>	11	20.4	67	22.1
<i>Very Important</i>	20	37	38	12.5
<i>Total</i>	50	92.6	273	90.1
<i>Missing</i>	4	7.4	30	9.9
<i>Changes in insurance rates</i>				
<i>Not Important At All</i>	2	3.7	51	16.8
<i>Not Very Important</i>	5	9.3	43	14.2
<i>Somewhat Important</i>	13	24.1	87	28.7
<i>Very Important</i>	30	55.6	94	31.0
<i>Total</i>	50	92.6	275	90.8
<i>Missing</i>	4	7.4	28	9.2
<i>Changes to the building code</i>				
<i>Not Important At All</i>	2	3.7	63	20.8
<i>Not Very Important</i>	11	20.4	53	17.5
<i>Somewhat Important</i>	11	20.4	87	28.7
<i>Very Important</i>	26	48.1	69	22.8
<i>Total</i>	50	92.6	272	89.8
<i>Missing</i>	4	7.4	31	10.2

<i>Ability to travel easily within [Oakwood Beach/Sea Bright]</i>				
<i>Not Important At All</i>	18	33.3	43	14.2
<i>Not Very Important</i>	12	22.2	44	14.5
<i>Somewhat Important</i>	9	16.7	114	37.6
<i>Very Important</i>	12	22.2	74	24.4
<i>Total</i>	51	94.4	275	90.8
<i>Missing</i>	3	5.6	28	9.2
<i>Ability to travel easily outside of [Oakwood Beach/Sea Bright]</i>				
<i>Not Important At All</i>	12	22.2	49	16.2
<i>Not Very Important</i>	13	24.1	46	15.2
<i>Somewhat Important</i>	13	24.1	95	31.4
<i>Very Important</i>	12	22.2	84	27.7
<i>Total</i>	50	92.6	274	90.4
<i>Missing</i>	4	7.4	29	9.6
<i>Financial incentives to rebuild your home in the same community from the government (aid programs)</i>				
<i>Not Important At All</i>	22	40.7	106	35.0
<i>Not Very Important</i>	8	14.8	38	12.5
<i>Somewhat Important</i>	6	11.1	64	21.1
<i>Very Important</i>	14	25.9	63	20.8
<i>Total</i>	50	92.6	271	89.4
<i>Missing</i>	4	7.4	32	10.6
<i>Financial incentives to build your home in a new location from the government (aid programs)</i>				
<i>Not Important At All</i>	19	35.2	152	50.2
<i>Not Very Important</i>	6	11.1	52	17.2
<i>Somewhat Important</i>	7	13	38	12.5
<i>Very Important</i>	19	35.2	27	8.9
<i>Total</i>	51	94.4	269	88.8
<i>Missing</i>	3	5.6	34	11.2
<i>Help from other organizations (such as a local church or civic group)</i>				
<i>Not Important At All</i>	13	24.1	131	43.2
<i>Not Very Important</i>	7	13	68	22.4
<i>Somewhat Important</i>	11	20.4	43	14.2
<i>Very Important</i>	19	35.2	28	9.2
<i>Total</i>	50	92.6	270	89.1
<i>Missing</i>	4	7.4	33	10.9

<i>Trustworthiness of organizations running the buyout program</i>				
<i>Not Important At All</i>	8	14.8	-	-
<i>Not Very Important</i>	2	3.7	-	-
<i>Somewhat Important</i>	7	13	-	-
<i>Very Important</i>	32	59.3	-	-
<i>Total</i>	49	90.7	-	-
<i>Missing</i>	5	9.3	-	-

<i>Trustworthiness of community leaders</i>				
<i>Not Important At All</i>	8	14.8	40	13.2
<i>Not Very Important</i>	5	9.3	31	10.2
<i>Somewhat Important</i>	8	14.8	85	28.1
<i>Very Important</i>	29	53.7	115	38.0
<i>Total</i>	50	92.6	271	89.4
<i>Missing</i>	4	7.4	32	10.6

<i>Risk perception – risk of recurrence (the chances of a future event like Hurricane Sandy affecting [Oakwood Beach/Sea Bright])</i>				
<i>An event of similar magnitude to Hurricane Sandy is likely to affect [Oakwood Beach/Sea Bright] in the next five years.</i>				
<i>Strongly Agree</i>	22	40.7	29	9.6
<i>Agree</i>	7	13	49	16.2
<i>Neutral</i>	11	20.4	85	28.1
<i>Disagree</i>	9	16.7	89	29.4
<i>Strongly Disagree</i>	2	3.7	39	12.9
<i>Total</i>	51	94.4	291	96.0
<i>Missing</i>	3	5.6	12	4.0

<i>An event of similar magnitude to Hurricane Sandy is likely to affect [Oakwood Beach/Sea Bright] in the next ten years.</i>				
<i>Strongly Agree</i>	20	37	38	12.5
<i>Agree</i>	6	11.1	77	25.4
<i>Neutral</i>	18	33.3	86	28.4
<i>Disagree</i>	5	9.3	65	21.5
<i>Strongly Disagree</i>	1	1.9	24	7.9
<i>Total</i>	50	92.6	290	95.7
<i>Missing</i>	4	7.4	13	4.3

<i>An event of similar magnitude to Hurricane Sandy is likely to affect [Oakwood Beach/Sea Bright] in the next twenty years.</i>				
<i>Strongly Agree</i>	24	44.4	70	23.1
<i>Agree</i>	10	18.5	93	30.7

<i>Neutral</i>	12	22.2	80	26.4
<i>Disagree</i>	3	5.6	31	10.2
<i>Strongly Disagree</i>	1	1.9	11	3.6
<i>Total</i>	50	92.6	285	94.1
<i>Missing</i>	4	7.4	18	5.9

An event of similar magnitude to Hurricane Sandy is never likely to affect [Oakwood Beach/Sea Bright] again.

<i>Strongly Disagree</i>	25	46.3	118	38.9
<i>Disagree</i>	9	16.7	79	26.1
<i>Neutral</i>	11	20.4	67	22.1
<i>Agree</i>	-	-	18	5.9
<i>Strongly Agree</i>	5	9.3	9	3.0
<i>Total</i>	50	92.6	291	96.0
<i>Missing</i>	4	7.4	12	4.0

Risk perception – risk of recurrence (the chances of a future event like Hurricane Sandy affecting [Oakwood Beach/Sea Bright]) [recoded]

An event of similar magnitude to Hurricane Sandy is likely to affect [Oakwood Beach/Sea Bright] in the next five years.

<i>Agree</i>	29	53.7	78	25.7
<i>Neutral</i>	11	20.4	128	42.2
<i>Disagree</i>	11	20.4	85	28.1
<i>Total</i>	51	94.4	291	96.0
<i>Missing</i>	3	5.6	12	4.0

An event of similar magnitude to Hurricane Sandy is likely to affect [Oakwood Beach/Sea Bright] in the next ten years.

<i>Agree</i>	26	48.1	115	38.0
<i>Neutral</i>	6	11.1	89	29.4
<i>Disagree</i>	18	33.3	86	28.4
<i>Total</i>	50	92.6	290	95.7
<i>Missing</i>	4	7.4	13	4.3

An event of similar magnitude to Hurricane Sandy is likely to affect [Oakwood Beach/Sea Bright] in the next twenty years.

<i>Agree</i>	34	63	163	53.8
<i>Neutral</i>	4	7.4	42	13.9
<i>Disagree</i>	12	22.2	80	26.4
<i>Total</i>	50	92.6	285	94.1
<i>Missing</i>	4	7.4	18	5.9

<i>An event of similar magnitude to Hurricane Sandy is never likely to affect [Oakwood Beach/Sea Bright] again.</i>				
<i>Agree</i>	34	63	197	65.0
<i>Neutral</i>	5	9.3	27	8.9
<i>Disagree</i>	11	20.4	67	22.1
<i>Total</i>	50	92.6	291	96.0
<i>Missing</i>	4	7.4	12	4.0
<i>Risk of recurrence indexed</i>				
<i>Agree</i>	29	53.7	120	39.6
<i>Neutral</i>	10	18.5	106	35.0
<i>Disagree</i>	11	20.4	59	19.5
<i>Total</i>	50	92.6	285	94.1
<i>Missing</i>	4	7.4	18	5.9
<i>Risk perception – potential impacts (of an event [like Hurricane Sandy] within the next ten years)</i>				
<i>Likelihood of major damage to your home.</i>				
<i>Very Likely</i>	24	44.4	86	28.4
<i>Somewhat Likely</i>	18	33.3	125	41.3
<i>Not Very Likely</i>	7	13	63	20.8
<i>Not Likely At All</i>	2	3.7	19	6.3
<i>Total</i>	51	94.4	293	96.7
<i>Missing</i>	3	5.6	10	3.3
<i>Likelihood of injury to you or members of your household.</i>				
<i>Very Likely</i>	17	31.5	16	5.3
<i>Somewhat Likely</i>	14	25.9	24	7.9
<i>Not Very Likely</i>	11	20.4	141	46.5
<i>Not Likely At All</i>	9	16.7	112	37.0
<i>Total</i>	51	94.4	293	96.7
<i>Missing</i>	3	5.6	10	3.3
<i>Likelihood of health problems to you or members of your household.</i>				
<i>Very Likely</i>	19	35.2	16	5.3
<i>Somewhat Likely</i>	16	29.6	39	12.9
<i>Not Very Likely</i>	9	16.7	133	43.9
<i>Not Likely At All</i>	7	13	105	34.7
<i>Total</i>	51	94.4	293	96.7
<i>Missing</i>	3	5.6	10	3.3

Risk perception – potential impacts (of an event [like Hurricane Sandy] within the next ten years) [recoded]

Likelihood of major damage to your home.

<i>Likely</i>	42	77.8	211	69.6
<i>Not Likely</i>	9	16.7	82	27.1
<i>Total</i>	51	94.4	293	96.7
<i>Missing</i>	3	5.6	10	3.3

Likelihood of injury to you or members of your household.

<i>Likely</i>	31	57.4	40	13.2
<i>Not Likely</i>	20	37	253	83.5
<i>Total</i>	51	94.4	293	96.7
<i>Missing</i>	3	5.6	10	3.3

Likelihood of health problems to you or members of your household.

<i>Likely</i>	35	64.8	55	18.2
<i>Not Likely</i>	16	29.6	238	78.5
<i>Total</i>	51	94.4	293	96.7
<i>Missing</i>	3	5.6	10	3.3

Impacts indexed.

<i>Likely</i>	35	64.8	58	19.1
<i>Not Likely</i>	16	29.6	235	77.6
<i>Total</i>	51	94.4	293	96.7
<i>Missing</i>	3	5.6	10	3.3

Demographics

Average Age

<i>Mean</i>	54	60
-------------	----	----

Age categorized

23-38	6	11.1	18	5.9
39-54	21	38.9	80	26.4
55-70	24	44.4	127	41.9
71-86	3	5.6	56	18.5
87-102	-	-	10	3.3
<i>Total</i>	54	100	291	96.0
<i>Missing</i>	-	-	12	4

Seniors in your home over 64?

<i>No</i>	34	63	166	54.8
<i>Yes</i>	19	35.2	126	41.6
<i>Total</i>	53	98.1	292	96.4

<i>Missing</i>	1	1.9	11	3.6
<i>Children in your home under 18?</i>				
<i>No</i>	33	61.1	238	78.5
<i>Yes</i>	20	37	54	17.8
<i>Total</i>	53	98.1	292	96.4
<i>Missing</i>	1	1.9	11	3.6
<i>Seniors in your home over 64 or children in your home under 18?</i>				
<i>No Dependents</i>	18	33.3	122	40.3
<i>At least 1 dependent</i>	35	64.8	170	56.1
<i>Total</i>	53	98.1	292	96.4
<i>Missing</i>	1	1.9	11	3.6
<i>Household size</i>				
<i>1</i>	6	11.1	90	29.7
<i>2</i>	17	31.5	141	46.5
<i>3</i>	9	16.7	26	8.6
<i>4</i>	16	29.6	31	10.2
<i>5</i>	3	5.6	9	3.0
<i>6</i>	2	3.7	2	.7
<i>7</i>	-	-	2	.7
<i>8</i>	-	-	1	.3
<i>9</i>	1	1.9	-	-
<i>Missing</i>			1	.3
<i>What was your total household income before taxes for the year 2011 (the year prior to Hurricane Sandy)?</i>				
<i>Less than \$20,000</i>	3	5.6	10	3.3
<i>\$20,000-\$39,999</i>	4	7.4	14	4.6
<i>\$40,000-\$59,999</i>	3	5.6	32	10.6
<i>\$60,000-\$79,999</i>	13	24.1	25	8.3
<i>\$80,000-\$99,999</i>	9	16.7	26	8.6
<i>\$100,000-\$199,999</i>	14	25.9	83	27.4
<i>\$200,000 and up</i>	2	3.7	67	22.1
<i>Total</i>	48	88.9	257	84.8
<i>Missing</i>	6	11.1	46	15.2
<i>What was your total household income before taxes for the year 2013 (the year after Hurricane Sandy)?</i>				
<i>Less than \$20,000</i>	2	3.7	13	4.3

\$20,000-\$39,999	5	9.3	20	6.6
\$40,000-\$59,999	2	3.7	31	10.2
\$60,000-\$79,999	13	24.1	23	7.6
\$80,000-\$99,999	10	18.5	36	11.9
\$100,000-\$199,999	13	24.1	64	21.1
\$200,000 and up	3	5.6	70	23.1
<i>Total</i>	48	88.9	257	84.8
<i>Missing</i>	6	11.1	46	15.2

Change in income from pre- to post-Sandy.

<i>Decrease</i>	13	16.7	34	11.2
<i>No Change</i>	35	64.8	210	69.3
<i>Increase</i>	-	-	13	4.3
<i>Total</i>	48	88.9	257	84.8
<i>Missing</i>	6	11.1	46	15.2

What was your total household income before taxes for the year 2011 (the year prior to Hurricane Sandy)?[recoded]

<i>Less than 100k</i>	32	59.3	107	35.3
<i>100k or more</i>	16	29.6	150	49.5
<i>Total</i>	48	88.9	257	84.8
<i>Missing</i>	6	11.1	46	15.2

What was your total household income before taxes for the year 2013 (the year after Hurricane Sandy)?[recoded]

<i>Less than 100k</i>	32	59.3	123	40.6
<i>100k or more</i>	16	29.6	134	44.2
<i>Total</i>	48	88.9	257	84.8
<i>Missing</i>	6	11.1	46	15.2

What was your total household income before taxes for the year 2011 (the year prior to Hurricane Sandy)?[recoded]

<i>Below or at Median HH Income</i>	23	42.6	81	26.7
<i>Above Median HH Income</i>	25	46.3	176	58.1
<i>Total</i>	48	88.9	257	84.8
<i>Missing</i>	6	11.1	46	15.2

What was your total household income before taxes for the year 2013 (the year after Hurricane Sandy)?[recoded]

<i>Below or at Median HH Income</i>	22	40.7	87	28.7
<i>Above Median HH Income</i>	26	48.1	170	56.1
<i>Total</i>	48	88.9	257	84.8

<i>Missing</i>	6	11.1	46	15.2
<i>What is your sex?</i>				
<i>Female</i>	32	59.3	139	45.9
<i>Male</i>	22	40.7	156	51.5
<i>Total</i>	54	100	295	97.4
<i>Missing</i>	-	-	8	2.6
<i>What is your race?</i>				
<i>White</i>	50	92.6	281	92.7
<i>Black or African American</i>	-	-	1	.3
<i>Asian</i>	3	5.6	7	2.3
<i>Other (please specify)</i>	1	1.9	5	1.7
<i>Total</i>	54	100	294	97.0
<i>Missing</i>	-	-	9	3.0
<i>What is your race? [recoded]</i>				
<i>Not White</i>	4	7.4	13	4.3
<i>White</i>	50	92.6	281	92.7
<i>Total</i>	54	100	294	97.0
<i>Missing</i>	-	-	9	3.0
<i>What is the highest degree or level of school you completed? If currently enrolled, mark the previous grade or highest degree received.</i>				
<i>9th grade through 11th (no diploma)</i>	4	7.4	2	.7
<i>High school diploma or GED</i>	12	22.2	25	8.3
<i>Technical School</i>	5	9.3	8	2.6
<i>Some College or Associates Degree (AA)</i>	8	14.8	52	17.2
<i>Bachelor's Degree (BS, BA, etc.)</i>	12	22.2	102	33.7
<i>Master's Degree (MS, MA, etc.)</i>	9	16.7	66	21.8
<i>Professional Degree (MD, JD, etc.)</i>	2	3.7	26	8.6
<i>Doctoral Degree (PhD)</i>	1	1.9	13	4.3
<i>Total</i>	53	98.1	294	97.0
<i>Missing</i>	1	1.9	9	3.0
<i>What is the highest degree or level of school you completed? If currently enrolled, mark the previous grade or highest degree received. [recoded]</i>				
<i>Less than a bachelor's degree</i>	29	53.7	87	11.6
<i>Bachelors or higher</i>	24	44.4	207	85.4
<i>Total</i>	53	98.1	294	97.0

<i>Missing</i>	1	1.9	22	3.0
<i>What is the highest degree or level of school you completed? If currently enrolled, mark the previous grade or highest degree received. [recoded]</i>				
<i>Less than some college</i>	21	38.9	35	11.6
<i>Some college or bachelors</i>	20	37	154	50.8
<i>More than bachelors</i>	12	22.2	145	34.7
<i>Total</i>	53	98.1	294	97.0
<i>Missing</i>	1	1.9	9	3.0
<i>Copy of results and contact information for follow-up interview</i>				
<i>Would you like a copy of the completed results?</i>				
<i>No</i>	26	48.1	136	44.9
<i>Yes</i>	28	51.9	166	54.8
<i>Total</i>	54	100	302	99.7
<i>Missing</i>	-	-	1	.3
<i>The researcher may contact me for a follow-up interview.</i>				
<i>No</i>	30	55.6	160	52.8
<i>Yes</i>	24	44.4	142	46.9
<i>Total</i>	54	100	302	99.7
<i>Missing</i>	-	-	1	.3

Appendix E

IRB PROTOCOL



RESEARCH OFFICE

210 Halliburton Hall
University of Delaware
Newark, Delaware 19716-1551
PA: 302/831-2136
Fax: 302/831-2828

DATE: October 14, 2013

TO: Sue McNeil, PhD
FROM: University of Delaware IRB

STUDY TITLE: [523471-1] Understanding the Relationships between Household Decisions and Infrastructure Investment in Disaster Recovery: Cases from Superstorm Sandy

SUBMISSION TYPE: New Project

ACTION: APPROVED
APPROVAL DATE: October 14, 2013
EXPIRATION DATE: October 13, 2014
REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # 6,7

Thank you for your submission of New Project materials for this research study. The University of Delaware IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All sponsor reporting requirements should also be followed.

Please report all NON-COMPLIANCE issues or COMPLAINTS regarding this study to this office.

Please note that all research records must be retained for a minimum of three years.

Appendix F

COMMUNITY CENSUS PROFILES

Table 35: Case Study Community Profiles

	<u>Pilot</u> Prime Hook, DE Census Tract 501.03	<u>Comparison</u> Sea Bright Borough, NJ	<u>Buyout</u> Oakwood Beach, NY Census Tract 128.05
<i>Population</i>			
<i>Total Population</i>	4,445	1,412	3,158
<i>Housing Status (in housing units unless noted)</i>			
<i>Total</i>	2,312	1,211	1,154
<i>Occupied</i>	1,826 78.98%	792 65.40%	1,091 94.54%
<i>Owner-occupied</i>	1607 69.51%	433 35.76%	829 71.84%
<i>Households with individuals under 18</i>	465 20.11%	106 8.75%	415 35.96%
<i>Vacant</i>	486 21.02%	419 34.60%	63 5.46%
<i>Vacant: for rent</i>	15 0.65%	67 5.53%	20 1.73%
<i>Vacant: for sale</i>	72 3.11%	12 0.99%	22 1.91%
<i>Population by Sex</i>			
<i>Male</i>	2,159 48.57%	729 51.63%	1,592 50.41%
<i>Female</i>	2,286 51.43%	683 48.37%	1,566 49.59%
<i>Population by Age</i>			
<i>Under 18</i>	867 19.51%	160 11.33%	713 22.58%
<i>18 & over</i>	3,578 80.49%	1,252 88.67%	2,445 77.42%
<i>20 - 24</i>	174 3.91%	58 4.11%	196 6.21%
<i>25 - 34</i>	414 9.31%	212 15.01%	372 11.78%

35 - 49	838 18.85%	361 25.57%	745 23.59%
50 - 64	1,146 25.78%	400 28.33%	686 21.72%
65 & over	928 20.88%	205 14.52%	360 11.40%

Population by Race

White	3,910 87.96%	1,335 94.55%	2,894 91.64%
African American	299 6.73%	11 0.78%	24 0.76%
Asian	84 1.89%	32 2.27%	153 4.84%
American Indian and Alaska Native	19 0.43%	0 0.00%	8 0.25%
Native Hawaiian and Pacific Islander	3 0.07%	0 0.00%	0 0.00%
Other	78 1.75%	21 1.49%	39 1.23%
Identified by two or more	52 1.17%	13 0.92%	40 1.27%

Educational Attainment

Less than 9th grade	51 1.50%	10 0.90%	104 4.50%
9th to 12th grade, no diploma	165 4.90%	7 0.60%	210 9.10%
High school graduate (includes equivalency)	1,292 38.10%	182 16.50%	833 36.00%
Some college, no degree	501 14.80%	245 22.30%	464 20.00%
Associate's degree	530 15.60%	69 6.30%	70 3.00%
Bachelor's degree	531 15.60%	386 35.10%	432 18.60%
Graduate or professional degree	328 9.70%	202 18.30%	204 8.80%
Total	3,398 100.20%	1,101 100.00%	2,317 100.00%

Income

<i>Median household income*</i>	83,265	78,550	77,788
<i>Mean household income*</i>	75,807	139,847	103,167
Household Income*			
<i>Less than \$10,000</i>	101 5.90%	6 1.80%	0 0.00%
<i>\$10,000 to \$14,999</i>	54 3.15%	4 1.20%	0 0.00%
<i>\$15,000 to \$24,999</i>	130 7.59%	14 4.30%	65 7.20%
<i>\$25,000 to \$34,999</i>	178 10.39%	11 3.40%	108 12.00%
<i>\$35,000 to \$49,999</i>	182 10.62%	24 7.40%	18 2.00%
<i>\$50,000 to \$74,999</i>	255 14.89%	27 8.30%	220 24.50%
<i>\$75,000 to \$99,999</i>	345 20.14%	96 29.50%	135 15.00%
<i>\$100,000 to \$149,999</i>	350 20.43%	36 11.10%	161 17.90%
<i>\$150,000 to \$199,999</i>	87 5.08%	30 9.20%	102 11.30%
<i>\$200,000 or more</i>	31 1.81%	77 23.70%	90 10.00%
<i>Total</i>	1,713 100.00%	325 99.90%	899 99.90%

Data Sources: Census 2010, American Community Survey 2011

**Data from American Community Survey
Income in 2011 inflation-adjusted dollars*

*Due to size constraints, a census tract was not used for Prime Hook, DE and Sea Bright,
NJ*

Appendix G
MAPS OF STUDY SITES

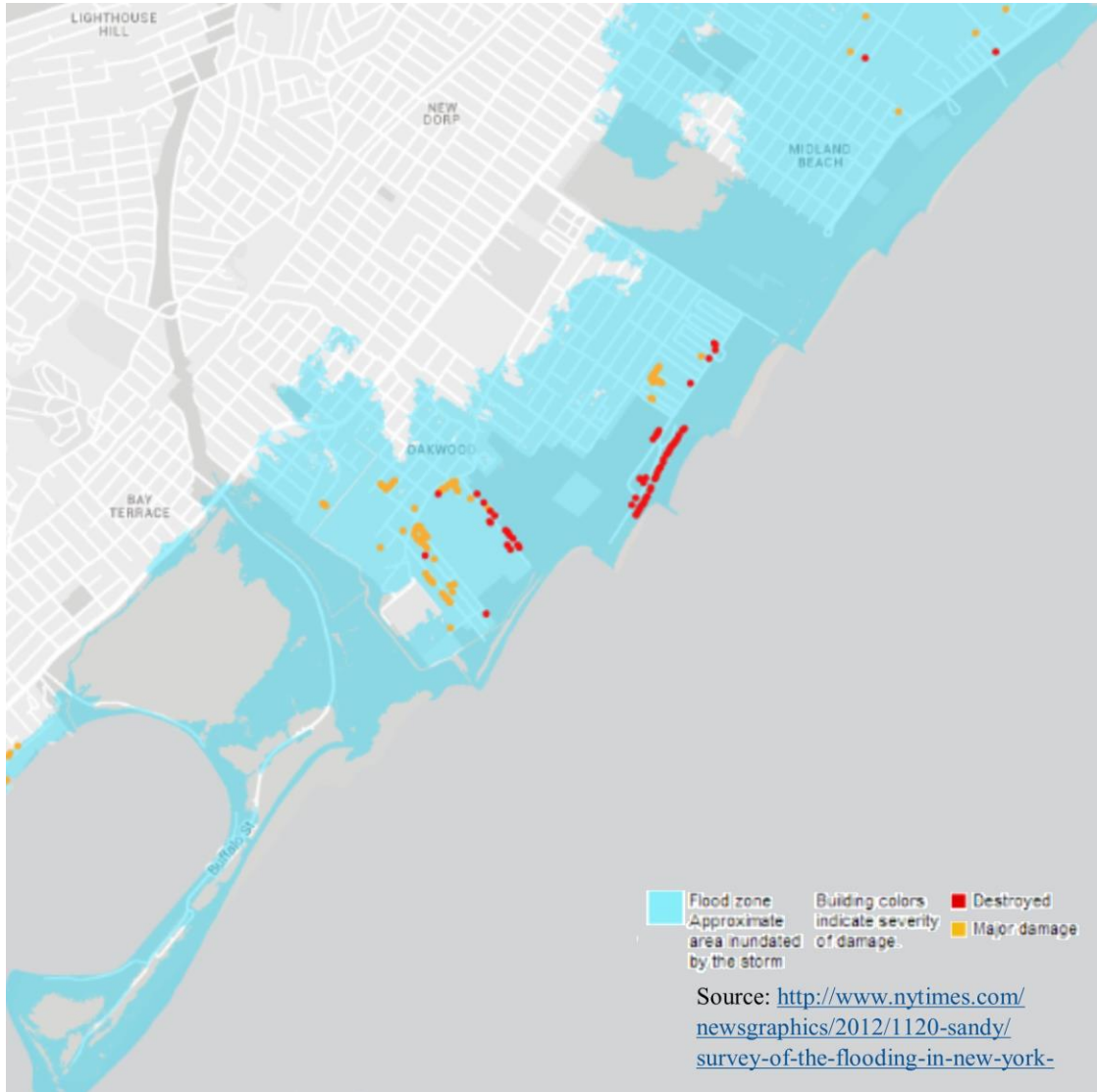


Figure 8: Oakwood Damages

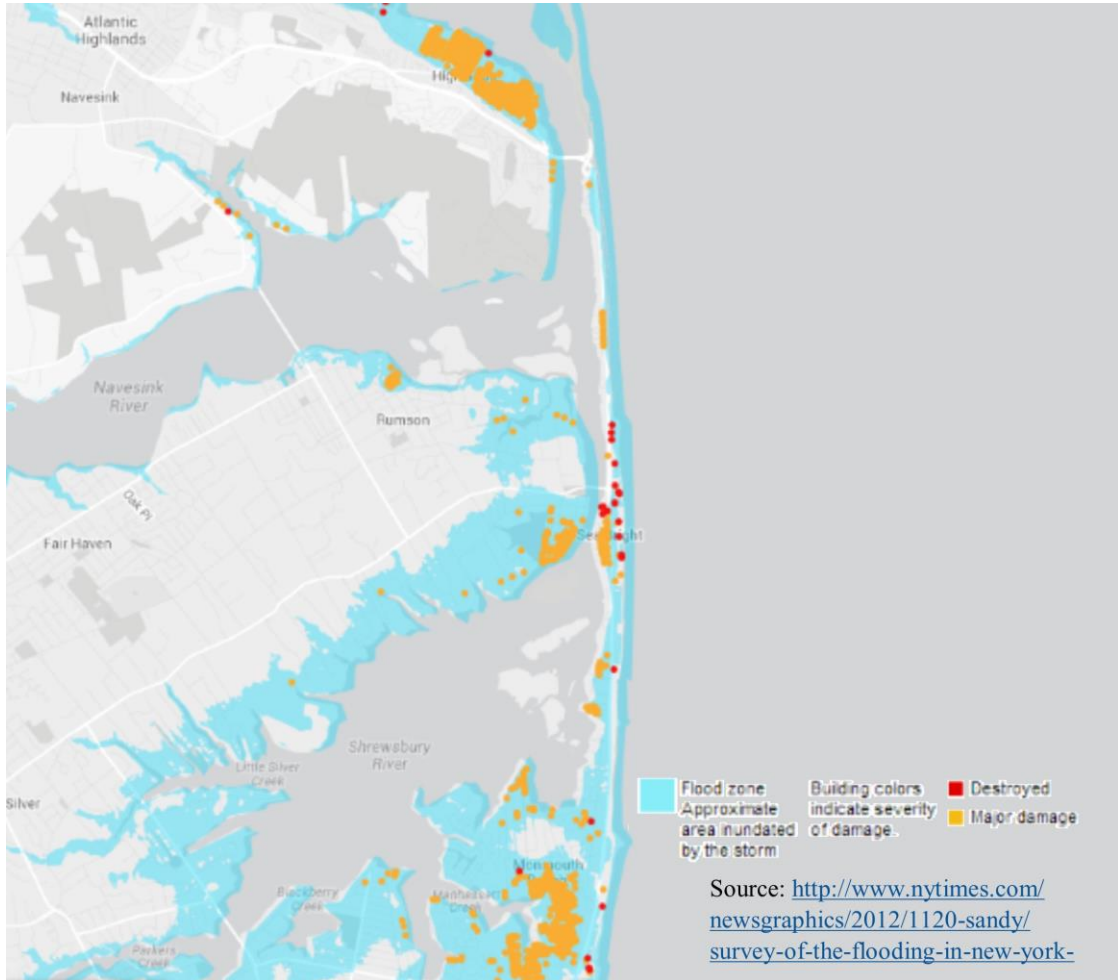


Figure 9: Sea Bright Damages

Appendix H

RECRUITMENT MATERIALS



Volunteers Needed for Research Study

We need participants for a research study:

“Understanding the Relationships between Household Decisions and Infrastructure Investment in Disaster Recovery: Cases from Superstorm Sandy”

Description of Project: We are researching how Superstorm Sandy affected residents’ perception of where they live. As a participant, you will be asked to complete an interview, describing your experiences with the storm and life after Sandy. Your participation will take about one hour. Once you contact us expressing your interest in participating, we will re-contact you to set up an interview in early 2014.

To participate: Please contact Alex Greer by phone at 302-831-1442 or by e-mail at Agreer@udel.edu. You must have been a resident of Oakwood Beach at the time Superstorm Sandy hit, at least 18 years old, and a homeowner.

To learn more, contact one of the principle investigator of the study, Dr. Sue McNeil or Dr. Joseph Trainor, by phone at 302-831-4203 or by e-mail at McNeil@udel.edu or Trainor@udel.edu. This research has been reviewed and approved by the University of Delaware Institutional Review Board.

Alex Greer Agreer@udel.edu 302-831-1442 Superstorm Sandy Study
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---	---	---	---	---	---	---	---



To Whom It May Concern:

The intent of this letter is to inform you of the research study "Understanding the Relationships between Household Decisions and Infrastructure Investment in Disaster Recovery: Cases from Superstorm Sandy" currently beginning in Oakwood.

The purpose of this research is to understand how Superstorm Sandy affected residents' perception of where they live. Participants will be asked to complete an interview, describing their experiences with the storm and life after Sandy. Participation will take about one hour. We expect interviews to begin in early 2014.

Participation in this study is voluntary. Participants must have been a resident of Oakwood at the time Superstorm Sandy hit, at least 18 years old, and a homeowner.

If you would like to participate Please contact Alex Greer by phone at 302-831-1442 or by e-mail at Agreer@udel.edu.

If you are interested in learning more about the research, contact one of the principle investigators of the study, Dr. Sue McNeil or Dr. Joseph Trainor, by phone at 302-831-4203 or by e-mail at McNeil@udel.edu or Trainor@udel.edu.

This research is conducted with PhD student Alex Greer, under the direction of the principle investigators, and has been reviewed and approved by the University of Delaware Institutional Review Board.

Sincerely,

Dr. Sue McNeil

Dr. Joseph Trainor



To Whom It May Concern:

The intent of this letter is to inform you of the research study "Understanding the Relationships between Household Decisions and Infrastructure Investment in Disaster Recovery: Cases from Superstorm Sandy" currently beginning in Sea Bright.

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Sincerely,

Dr. Sue McNeil

Dr. Joseph Trainor

Appendix I

NEW YORK INTERVIEW REJECTION



STATE OF NEW YORK
EXECUTIVE CHAMBER
ALBANY 12224

ANDREW M. CUOMO
GOVERNOR

August 14, 2014

Alex Greer
University of Delaware
166 Graham Hall
111 Academy Street
Newark, DE 19716

Dear Mr. Greer:

Thank you for inviting Governor Cuomo to participate in an interview.

He was honored by your kind request and regrets that he is unable to accept your gracious invitation at this time. Please be assured, however, that we will keep your request in mind when planning his schedule in the future.

Thank you again for your thoughtful invitation.

Warmest regards.

Sincerely,

A handwritten signature in cursive script that reads "Jill DesRosiers".

Jill DesRosiers
Director of Scheduling

WE WORK FOR THE PEOPLE
PERFORMANCE * INTEGRITY * PRIDE

printed on recycled paper

Appendix J

THREE PRE- AND POST-BEST AND WORST FOCUSED CODES WORDLES

Figure 10 – Pre-Best Wordle

PRE-SANDY BEST



Figure 11 – Post-Best Wordle



Figure 12 – Pre-Worst Wordle



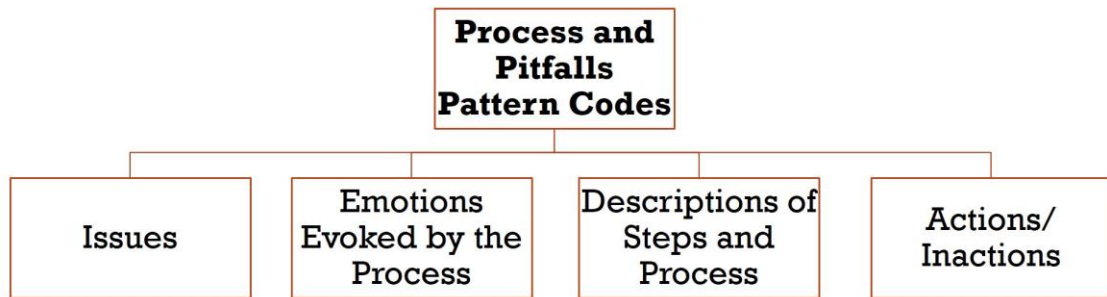
Figure 13 – Post-Worst Wordle

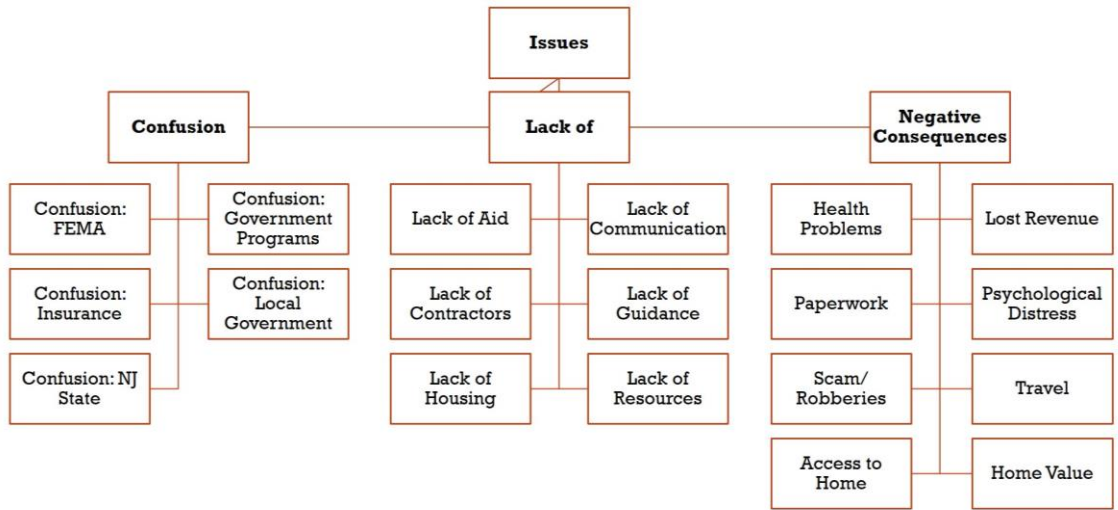


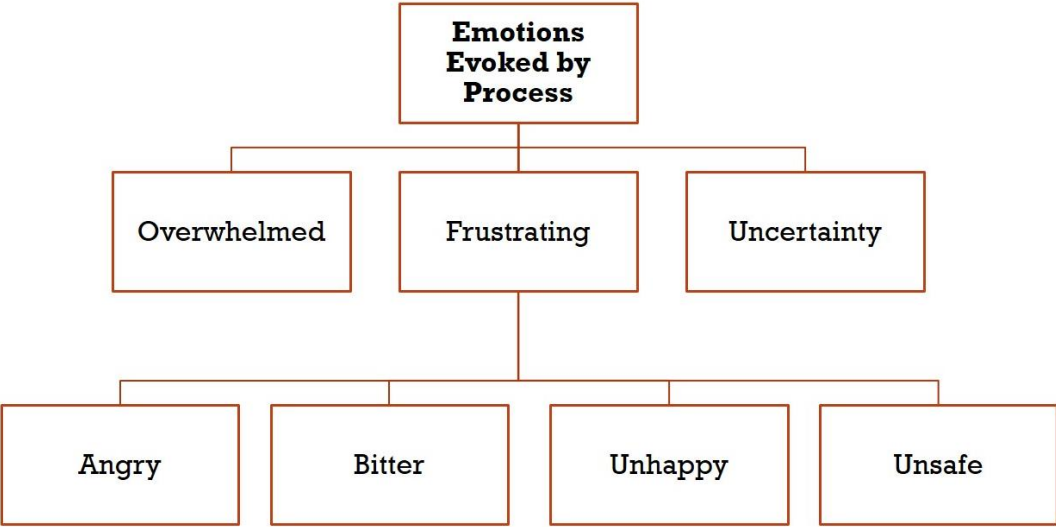
Appendix K

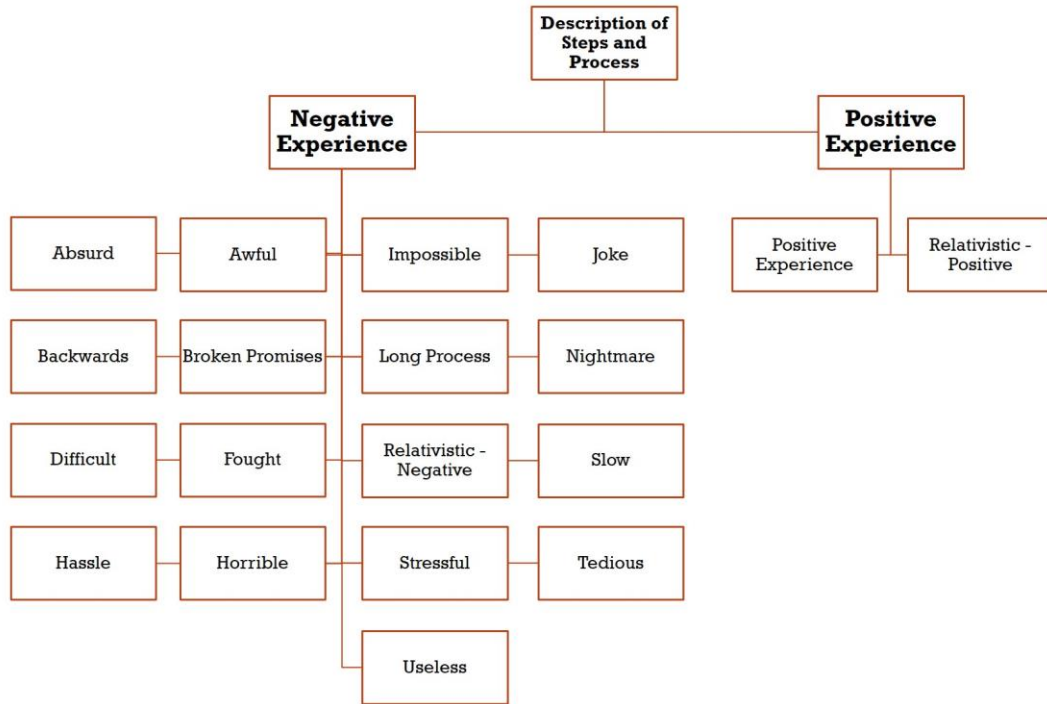
PROCESS AND PITFALLS FOCUSED CODES

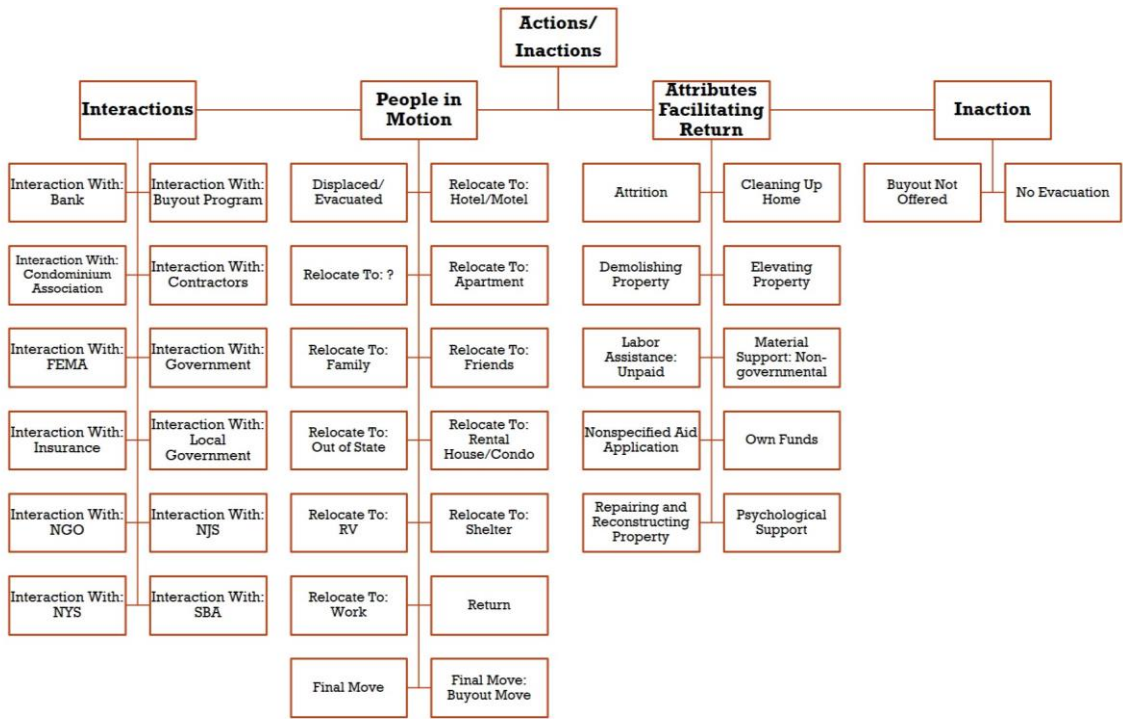
Figure 14 – Process and Pitfalls Focused Codes







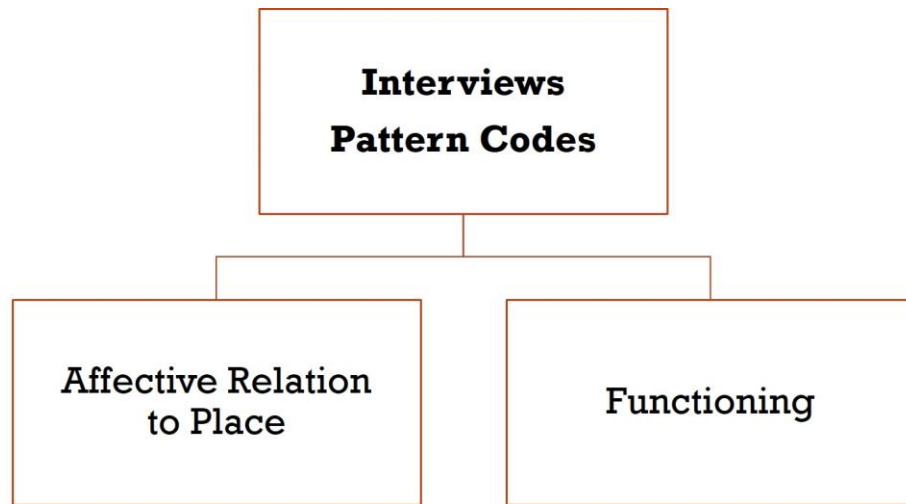


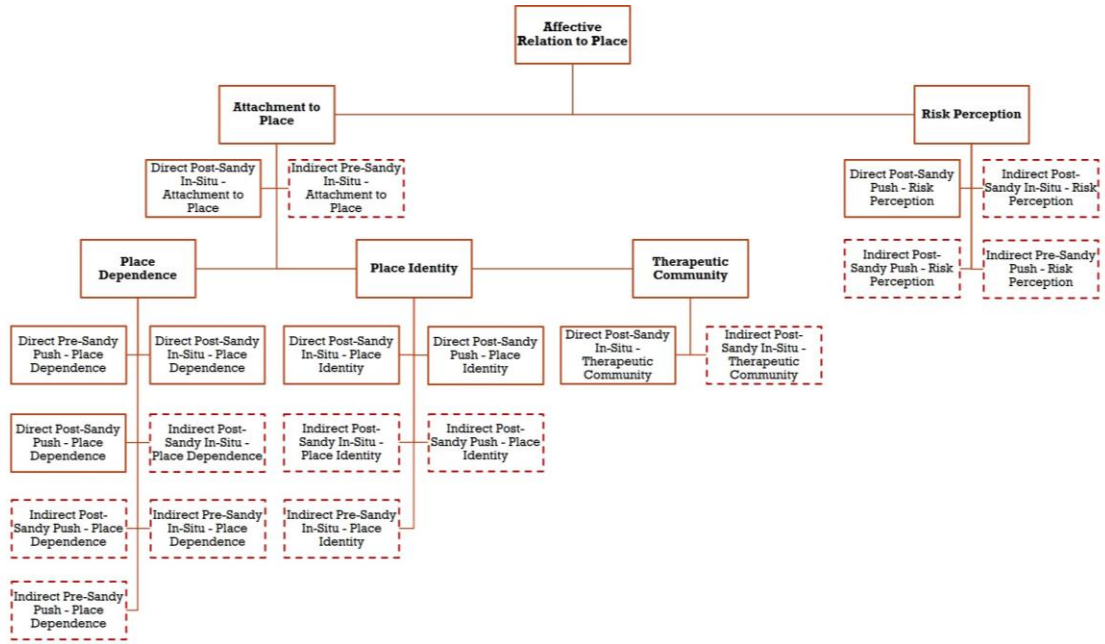


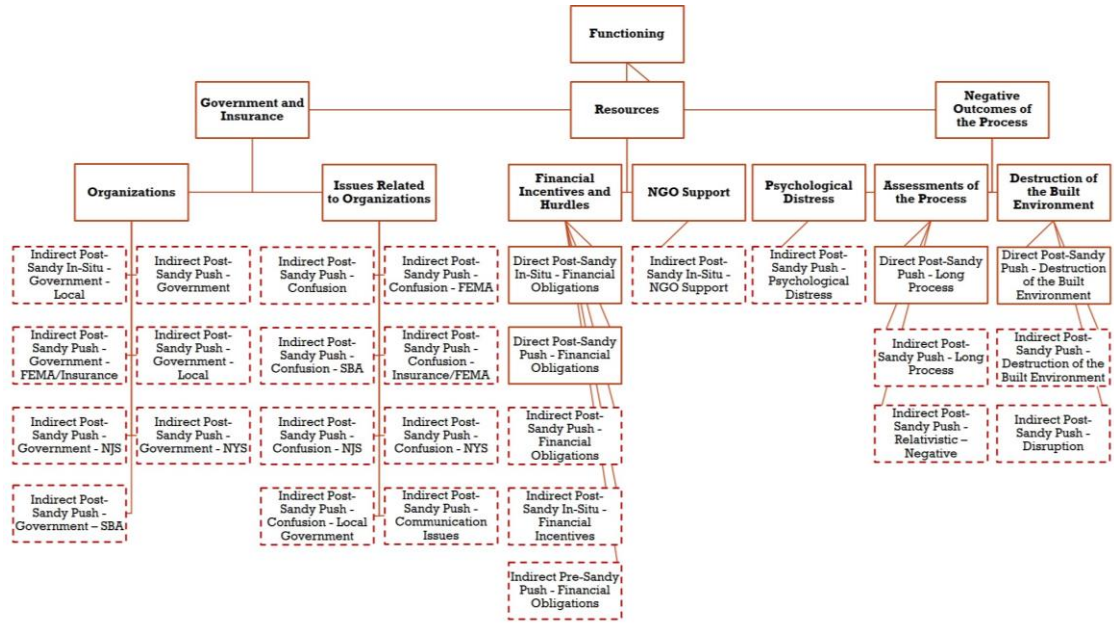
Appendix L

INTERVIEW PATTERN CODES

Figure 15 – Interview Pattern Codes







Appendix M

OAKWOOD BEACH QUESTIONNAIRE



168 Graham Hall, Newark, DE, 19711 | (302) 831-6618 | Smcneil@udel.edu

May 2014

Dear Oakwood Beach Resident:

This is our **third and final attempt** to ask for your participation in an important study about your experiences during and after Hurricane Sandy. It is critical that we receive feedback from the entire community on this significant issue. We are particularly interested in unique and different opinions. Let your voice be heard. Information from the original survey is included.

We are writing on behalf of the Disaster Research Center at the University of Delaware to ask for your participation in the following survey about your experiences during and after Hurricane Sandy. We are inviting every household in Oakwood Beach to participate. The goal is to better understand how you have been making housing decisions after the storm.

The University will be collecting information specific to your home, but we will not publish or release information about individual households. The results will only be presented for neighborhoods or the whole community. Topics will include questions about your home, your community, the impacts of the storm, how you decided where to live after the hurricane, and basic information about yourself and your household. The goal is to use the experiences of Oakwood Beach residents to learn more about why residents rebuild in the same location or move after a disaster.

We expect that for most people the questions below will take about 20-30 minutes to complete. Participation in this study is voluntary and your decision to participate will have no bearing on your relationship with the University of Delaware.

Please have one of the heads of this household (age 18 or older) complete this survey and return it in the enclosed postage paid envelope. Please return the survey **as soon as you complete it**.

If you have any questions about this survey please contact the Principal Investigator at the University, Sue McNeil, at (302) 831-6618. Alternatively, if you have any questions about your rights as a participant in this study, you can also contact the University of Delaware Institutional Review Board at (302) 831-2137. We appreciate your assistance, and look forward to learning more about you and your experiences with Hurricane Sandy.

Sincerely,

University of Delaware Disaster Research Center

First, we would like to ask you about the home you lived in at the time Hurricane Sandy occurred and the community of Oakwood Beach.

1. Do you own or rent the property addressed on the envelope of this survey?
 - Own
 - Rent (Please go to question 4)

2. Which of the following describes how you use this property? Mark all that apply.
 - Primary residence
 - Second home
 - Rental property
 - Other _____
 - Prefer not to answer

3. How long has this residence been owned by your family? Please answer in years.

_____ years

4. What type of home is this?
 - Single-family home
 - Multi-family home
 - Apartment
 - Condo/Townhome
 - Other _____
 - Don't know

5. When did you move into or take ownership of this house, apartment, or mobile home?
Please provide the calendar year (for example, 2001).

6. In total, how many years have you lived in Oakwood Beach?

Now, we would like you to answer a few questions about Oakwood Beach. Please tell me how strongly you “agree” or “disagree” with the following statements.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
7. I feel Oakwood Beach is a part of me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Being in Oakwood Beach says a lot about whom I am.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I am very attached to Oakwood Beach.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. No other place can compare to Oakwood Beach.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Oakwood Beach is the best place for what I like to do.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. The things I do at Oakwood Beach I would enjoy doing just as much at some similar community.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

You have two sections completed already. To understand how you saw your community prior to Hurricane Sandy, we would like to learn about your favorite and least favorite parts of your community **before the hurricane hit**.

13. Please list three things you **liked most** about Oakwood Beach **prior to Hurricane Sandy**.

1. _____
2. _____
3. _____

14. Please list three things you **liked least** about Oakwood Beach **prior to Hurricane Sandy**.

1. _____
2. _____
3. _____

In this section, we would like to ask you some questions about your home **at the time that Hurricane Sandy occurred.**

15. Which of the following describes the status of that property now? Has it been: (Mark all that apply)

- | | |
|--|--|
| <input type="checkbox"/> Abandoned | <input type="checkbox"/> Condemned |
| <input type="checkbox"/> Repairs completed; not elevated | <input type="checkbox"/> Repairs completed; elevated |
| <input type="checkbox"/> Repairs in progress | <input type="checkbox"/> Repairs scheduled to begin |
| <input type="checkbox"/> Structure was or will be totally rebuilt | <input type="checkbox"/> Property for sale or sold |
| <input type="checkbox"/> Structure was or will be demolished | <input type="checkbox"/> Prefer not to answer |
| <input type="checkbox"/> In good condition (did not require repairs) | |
| <input type="checkbox"/> Not sure (please explain) | |

16. Following Hurricane Sandy, have you invested in any of the following mitigation measures for future storms? (Mark all that apply)

- | | |
|--|---|
| <input type="checkbox"/> Installed storm shutters | <input type="checkbox"/> Elevated utilities |
| <input type="checkbox"/> Purchased additional insurance | <input type="checkbox"/> Installed roof fasteners |
| <input type="checkbox"/> Elevated your home | <input type="checkbox"/> Installed new pilings |
| <input type="checkbox"/> Installed hurricane windows | <input type="checkbox"/> None of the above |
| <input type="checkbox"/> Strengthened attachment to foundation | <input type="checkbox"/> Prefer not to answer |
| <input type="checkbox"/> Other (please explain) | |

17. If you selected any of the options above, how did you pay for it? (Mark all that apply)

- | | |
|---|---|
| <input type="checkbox"/> Personal funds/savings | <input type="checkbox"/> Loans from a financial institution |
| <input type="checkbox"/> Insurance | <input type="checkbox"/> Government support |
| <input type="checkbox"/> Borrowed from friends/family | <input type="checkbox"/> Did not select anything |
| <input type="checkbox"/> Non-profit assistance/aid | <input type="checkbox"/> Prefer not to answer |
| <input type="checkbox"/> Other (please explain) | |

18. Do you plan to invest in any of the following mitigation measures for future storms?

(Mark all that apply)

- | | |
|--|---|
| <input type="checkbox"/> Install storm shutters | <input type="checkbox"/> Elevate utilities |
| <input type="checkbox"/> Purchase additional insurance | <input type="checkbox"/> Install roof fasteners |
| <input type="checkbox"/> Elevate your home | <input type="checkbox"/> Install new pilings |
| <input type="checkbox"/> Install hurricane windows | <input type="checkbox"/> None of the above |
| <input type="checkbox"/> Strengthen attachment to foundation | <input type="checkbox"/> Prefer not to answer |
| <input type="checkbox"/> Other (please explain) | |

19. If you selected any of the options above, how do you plan to pay for it? (Mark all that apply)

- | | |
|---|---|
| <input type="checkbox"/> Personal funds/savings | <input type="checkbox"/> Loans from a financial institution |
| <input type="checkbox"/> Insurance | <input type="checkbox"/> Government support |
| <input type="checkbox"/> Borrow from friends/family | <input type="checkbox"/> Did not select anything |
| <input type="checkbox"/> Non-profit assistance/aid | <input type="checkbox"/> Prefer not to answer |
| <input type="checkbox"/> Other (please explain) | |

Now we would like you to answer questions about damage from the hurricane to your home and to your community.

20. How much damage did your home sustain related to Hurricane Sandy? Please estimate in dollars.

\$ _____

- Don't know (due to renter status)

21. Did you have flood insurance at the time that Hurricane Sandy occurred?

- Yes
 No (Please go to question 24)

22. What amount of this damage did flood insurance cover?

\$ _____

23. What did you base your estimate on?

	No Damage	Not Very Extensive	Somewhat Extensive	Very Extensive
24. How extensive was the damage to your home due to Hurricane Sandy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. How extensive was the damage to Oakwood Beach due to Hurricane Sandy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

This section asks you about travel disruptions resulting from Hurricane Sandy, both within and outside of Oakwood Beach.

26. At any time did the disruption from Hurricane Sandy affect your ability to travel **within** Oakwood Beach for everyday activities (go to work, church, the post office, the grocery store, etc.)?

- Yes
- No (Please go to question 28)

27. **How long** did the disruption from Hurricane Sandy affect your ability to travel **within** Oakwood Beach for everyday activities (go to work, church, the post office, the grocery store, etc.)?

- Less than a week
- Two to four weeks
- Two to six months
- Seven to twelve months
- More than a year

28. Did the disruption from Hurricane Sandy affect your ability to travel **outside** Oakwood Beach at any time?

- Yes
- No (Please go to question 30)

29. **How long** did the disruption from Hurricane Sandy inhibit your ability to travel **outside** Oakwood Beach?

- Less than a week
- Two to four weeks
- Two to six months
- Seven to twelve months
- More than a year

Following a disaster, people have many decisions they have to make about living in a community or leaving it. For this next set of questions, we would like to ask you about where you currently live.

30. Do you still live **in the same community** as you did at the time of Hurricane Sandy?

- Yes
- No

31. Do you still live **at the same address** as you did at the time of Hurricane Sandy?

- Yes
- No (Please share your new address on the lines below)

32. How long do you plan to live at your current residence?

- Less than one year
- One to five years
- More than five years

33. Were you offered money for your home (a buyout)?

- Yes
- No (Please go to question 37)

34. What was the name of the organization that made this offer?

35. Did you accept the offer?

- Yes
- No

36. Why did you make this decision?

For this next set of questions, please indicate how important each element was when making your decision about where to live after Hurricane Sandy.

	Not Important At All	Not Very Important	Somewhat Important	Very Important
37. The likelihood of a hurricane	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Concerns over sea level rise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Being close to family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Being close to friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Being close to employment opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. Being close to the beach	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. Access to affordable housing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. Family history in the area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. Opinions of neighbors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46. Concerns about going into debt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Changes in where homes can be built	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. Changes in insurance rates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. Changes to the building code	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. Ability to travel easily within Oakwood Beach	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Ability to travel easily outside of Oakwood Beach	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52. Financial incentives to rebuild your home in the same community from the government (aid programs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53. Financial incentives to build your home in a new location from the government (aid programs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Not Important At All	Not Very Important	Somewhat Important	Very Important
54. Help from other organizations (such as a local church or civic group)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55. Trustworthiness of organizations running the buyout program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. Trustworthiness of community leaders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

57. Were there any other important factors that influenced your decision about where you lived that were not listed? If so, what were they?

58. Please list three things you like **most** about where you currently live **after** Hurricane Sandy.

1. _____
2. _____
3. _____

59. Please list three things you like **least** about where you currently live **after** Hurricane Sandy.

1. _____
2. _____
3. _____

Now, we would like to ask you how you feel about the chances of a future event like Hurricane Sandy affecting Oakwood Beach.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
60. An event of similar magnitude to Hurricane Sandy is likely to affect Oakwood Beach in the next five years.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
61. An event of similar magnitude to Hurricane Sandy is likely to affect Oakwood Beach in the next ten years.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
62. An event of similar magnitude to Hurricane Sandy is likely to affect Oakwood Beach in the next twenty years.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
63. An event of similar magnitude to Hurricane Sandy is never likely to affect Oakwood Beach again.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

This section asks you to imagine that if there were such an event within the next ten years, what sort of impacts you would expect.

	Not Likely At All	Not Very Likely	Somewhat Likely	Very Likely
64. Likelihood of major damage to your home.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
65. Likelihood of injury to you or members of your household.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
66. Likelihood of health problems to you or members of your household.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Lastly, we would like to ask you some questions about yourself, your household, and for some closing comments.

67. What is your age (in years)?
_____ years old

68. What is your job or profession?

69. How many **adults** live in your home (individuals over the age of 17)?

70. How many of those adults are **seniors** (individuals over the age of 64)?

71. How many **children** currently live in your home (individuals 17 years old or younger)?

72. What was your total household income before taxes for **the year 2011** (the year prior to Hurricane Sandy)?

- | | |
|---|--|
| <input type="checkbox"/> Less than \$20,000 | <input type="checkbox"/> \$80,000-\$99,999 |
| <input type="checkbox"/> \$20,000-\$39,999 | <input type="checkbox"/> \$100,000-\$199,999 |
| <input type="checkbox"/> \$40,000-\$59,999 | <input type="checkbox"/> \$200,000 and up |
| <input type="checkbox"/> \$60,000-\$79,999 | |

73. What was your total household income before taxes for **the year 2013** (the year after Hurricane Sandy)?

- | | |
|---|--|
| <input type="checkbox"/> Less than \$20,000 | <input type="checkbox"/> \$80,000-\$99,999 |
| <input type="checkbox"/> \$20,000-\$39,999 | <input type="checkbox"/> \$100,000-\$199,999 |
| <input type="checkbox"/> \$40,000-\$59,999 | <input type="checkbox"/> \$200,000 and up |
| <input type="checkbox"/> \$60,000-\$79,999 | |

74. What is your sex?

- Male
 Female

75. What is your race?

- | | |
|---|--|
| <input type="checkbox"/> White | <input type="checkbox"/> Asian |
| <input type="checkbox"/> Black or African American | <input type="checkbox"/> American Indian |
| <input type="checkbox"/> Other (please specify) _____ | |

76. What is the highest degree or level of school you completed? If currently enrolled, mark the previous grade or highest degree received.

- | | |
|--|---|
| <input type="checkbox"/> Kindergarten through 8 th grade | <input type="checkbox"/> Bachelor's Degree (BS, BA, etc.) |
| <input type="checkbox"/> 9 th grade through 11 th (no diploma) | <input type="checkbox"/> Master's Degree (MS, MA, etc.) |
| <input type="checkbox"/> High school diploma or GED | <input type="checkbox"/> Professional Degree (MD, JD, etc.) |
| <input type="checkbox"/> Technical School | <input type="checkbox"/> Doctoral Degree (PhD) |
| <input type="checkbox"/> Some College or Associates Degree (AA) | |

Appendix N

SEA BRIGHT QUESTIONNAIRE



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May 2014

Dear Sea Bright Resident:

This is our **third and final attempt** to ask for your participation in an important study about your experiences during and after Hurricane Sandy. It is critical that we receive feedback from the entire community on this significant issue. We are particularly interested in unique and different opinions. Let your voice be heard. Information from the original survey is included.

We are writing on behalf of the Borough of Sea Bright and the Disaster Research Center at the University of Delaware to ask for your participation in the following survey about your experiences during and after Hurricane Sandy. We are inviting every household in the borough to participate. The goal is to better understand how you have been making housing decisions after the storm and to create specific data your community can use for planning purposes.

The University will be collecting information specific to your home, but we will not publish or release information about individual households. The results will only be presented for neighborhoods or the whole community. Topics will include questions about your home, your community, the impacts of the storm, how you decided where to live after the hurricane, and basic information about yourself and your household. The goal is to use the experiences of Sea Bright residents to learn more about why residents rebuild in the same location or move after a disaster.

We expect that for most people the questions below will take about 20-30 minutes to complete. Participation in this study is voluntary and your decision to participate will have no bearing on your relationship with the University of Delaware or the community of Sea Bright.

Please have one of the heads of this household (age 18 or older) complete this survey and return it in the enclosed postage paid envelope. Please return the survey **as soon as you complete it**.

If you have any questions about this survey, please contact Frank Lawrence at (732) 842-0099, extension 44 or the Principal Investigator at the University, Sue McNeil, at (302) 831-6618. Alternatively if you have any questions about your rights as a participant in this study, you can also contact the University of Delaware Institutional Review Board at (302) 831-2137. We appreciate your assistance, and look forward to learning more about you and your experiences with Hurricane Sandy.

Sincerely,

University of Delaware Disaster Research Center

Borough of Sea Bright

First, we would like to ask you about the home you lived in at the time Hurricane Sandy occurred and the community of Sea Bright.

1. Do you own or rent the property addressed on the envelope of this survey?
 - Own
 - Rent (Please go to question 4)

2. Which of the following describes how you use this property? Mark all that apply.
 - Primary residence
 - Second home
 - Rental property
 - Other _____
 - Prefer not to answer

3. How long has this residence been owned by your family? Please answer in years.

_____ years

4. What type of home is this?
 - Single-family home
 - Multi-family home
 - Apartment
 - Condo/Townhome
 - Other _____
 - Don't know

5. When did you move into or take ownership of this house, apartment, or mobile home? Please provide the calendar year (for example, 2001).

6. In total, how many years have you lived in Sea Bright?

Now, we would like you to answer a few questions about Sea Bright. Please tell me how strongly you “agree” or “disagree” with the following statements.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
7. I feel Sea Bright is a part of me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Being in Sea Bright says a lot about whom I am.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I am very attached to Sea Bright.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. No other place can compare to Sea Bright.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Sea Bright is the best place for what I like to do.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. The things I do at Sea Bright I would enjoy doing just as much at some similar community.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

You have two sections completed already. To understand how you saw your community prior to Hurricane Sandy, we would like to learn about your favorite and least favorite parts of your community **before the hurricane hit**.

13. Please list three things you **liked most** about Sea Bright **prior to Hurricane Sandy**.

1. _____
2. _____
3. _____

14. Please list three things you **liked least** about Sea Bright **prior to Hurricane Sandy**.

1. _____
2. _____
3. _____

In this section, we would like to ask you some questions about your home **at the time that Hurricane Sandy occurred.**

15. Which of the following describes the status of that property now? Has it been: (Mark all that apply)

- | | |
|--|--|
| <input type="checkbox"/> Abandoned | <input type="checkbox"/> Condemned |
| <input type="checkbox"/> Repairs completed; not elevated | <input type="checkbox"/> Repairs completed; elevated |
| <input type="checkbox"/> Repairs in progress | <input type="checkbox"/> Repairs scheduled to begin |
| <input type="checkbox"/> Structure was or will be totally rebuilt | <input type="checkbox"/> Property for sale or sold |
| <input type="checkbox"/> Structure was or will be demolished | <input type="checkbox"/> Prefer not to answer |
| <input type="checkbox"/> In good condition (did not require repairs) | |
| <input type="checkbox"/> Not sure (please explain) | |

16. Following Hurricane Sandy, have you invested in any of the following mitigation measures for future storms? (Mark all that apply)

- | | |
|--|---|
| <input type="checkbox"/> Installed storm shutters | <input type="checkbox"/> Elevated utilities |
| <input type="checkbox"/> Purchased additional insurance | <input type="checkbox"/> Installed roof fasteners |
| <input type="checkbox"/> Elevated your home | <input type="checkbox"/> Installed new pilings |
| <input type="checkbox"/> Installed hurricane windows | <input type="checkbox"/> None of the above |
| <input type="checkbox"/> Strengthened attachment to foundation | <input type="checkbox"/> Prefer not to answer |
| <input type="checkbox"/> Other (please explain) | |

17. If you selected any of the options above, how did you pay for it? (Mark all that apply)

- | | |
|---|---|
| <input type="checkbox"/> Personal funds/savings | <input type="checkbox"/> Loans from a financial institution |
| <input type="checkbox"/> Insurance | <input type="checkbox"/> Government support |
| <input type="checkbox"/> Borrowed from friends/family | <input type="checkbox"/> Did not select anything |
| <input type="checkbox"/> Non-profit assistance/aid | <input type="checkbox"/> Prefer not to answer |
| <input type="checkbox"/> Other (please explain) | |

18. Do you plan to invest in any of the following mitigation measures for future storms?

(Mark all that apply)

- | | |
|--|---|
| <input type="checkbox"/> Install storm shutters | <input type="checkbox"/> Elevate utilities |
| <input type="checkbox"/> Purchase additional insurance | <input type="checkbox"/> Install roof fasteners |
| <input type="checkbox"/> Elevate your home | <input type="checkbox"/> Install new pilings |
| <input type="checkbox"/> Install hurricane windows | <input type="checkbox"/> None of the above |
| <input type="checkbox"/> Strengthen attachment to foundation | <input type="checkbox"/> Prefer not to answer |
| <input type="checkbox"/> Other (please explain) | |

19. If you selected any of the options above, how do you plan to pay for it? (Mark all that apply)

- | | |
|---|---|
| <input type="checkbox"/> Personal funds/savings | <input type="checkbox"/> Loans from a financial institution |
| <input type="checkbox"/> Insurance | <input type="checkbox"/> Government support |
| <input type="checkbox"/> Borrow from friends/family | <input type="checkbox"/> Did not select anything |
| <input type="checkbox"/> Non-profit assistance/aid | <input type="checkbox"/> Prefer not to answer |
| <input type="checkbox"/> Other (please explain) | |

Now we would like you to answer questions about damage from the hurricane to your home and to your community.

20. How much damage did your home sustain related to Hurricane Sandy? Please estimate in dollars.

\$ _____

- Don't know (due to renter status)

21. Did you have flood insurance at the time that Hurricane Sandy occurred?

- Yes
 No (Please go to question 24)

22. What amount of this damage did flood insurance cover?

\$ _____

23. What did you base your estimate on?

	No Damage	Not Very Extensive	Somewhat Extensive	Very Extensive
24. How extensive was the damage to your home due to Hurricane Sandy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. How extensive was the damage to Sea Bright due to Hurricane Sandy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

This section asks you about travel disruptions resulting from Hurricane Sandy, both within and outside of Sea Bright.

26. At any time did the disruption from Hurricane Sandy affect your ability to travel **within** Sea Bright for everyday activities (go to work, church, the post office, the grocery store, etc.)?

- Yes
- No (Please go to question 28)

27. **How long** did the disruption from Hurricane Sandy affect your ability to travel **within** Sea Bright for everyday activities (go to work, church, the post office, the grocery store, etc.)?

- Less than a week
- Two to four weeks
- Two to six months
- Seven to twelve months
- More than a year

28. Did the disruption from Hurricane Sandy affect your ability to travel **outside** Sea Bright at any time?

- Yes
- No (Please go to question 30)

29. **How long** did the disruption from Hurricane Sandy inhibit your ability to travel **outside** Sea Bright?

- Less than a week
- Two to four weeks
- Two to six months
- Seven to twelve months
- More than a year

Following a disaster, people have many decisions they have to make about living in a community or leaving it. For this next set of questions, we would like to ask you about where you currently live.

30. Do you still live **in the same community** as you did at the time of Hurricane Sandy?

- Yes
- No

31. Do you still live **at the same address** as you did at the time of Hurricane Sandy?

- Yes
- No (Please share your new address on the lines below)

32. How long do you plan to live at your current residence?

- Less than one year
- One to five years
- More than five years

For this next set of questions, please indicate how important each element was when making your decision about where to live after Hurricane Sandy.

	Not Important At All	Not Very Important	Somewhat Important	Very Important
33. The likelihood of a hurricane	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Concerns over sea level rise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Being close to family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Being close to friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Being close to employment opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Being close to the beach	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Access to affordable housing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Not Important At All	Not Very Important	Somewhat Important	Very Important
40. Family history in the area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Opinions of neighbors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. Concerns about going into debt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. Changes in where homes can be built	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. Changes in insurance rates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. Changes to the building code	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46. Ability to travel easily within Sea Bright	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Ability to travel easily outside of Sea Bright	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. Financial incentives to rebuild your home in the same community from the government (aid programs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. Financial incentives to build your home in a new location from the government (aid programs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. Help from other organizations (such as a local church or civic group)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Trustworthiness of community leaders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

52. Were there any other important factors that influenced your decision about where you lived that were not listed? If so, what were they?

53. Please list three things you like **most** about where you currently live **after** Hurricane Sandy.

1. _____

2. _____

3. _____

54. Please list three things you like **least** about where you currently live **after** Hurricane Sandy.

1. _____

2. _____

3. _____

Now, we would like to ask you how you feel about the chances of a future event like Hurricane Sandy affecting Sea Bright.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
55. An event of similar magnitude to Hurricane Sandy is likely to affect Sea Bright in the next five years .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. An event of similar magnitude to Hurricane Sandy is likely to affect Sea Bright in the next ten years .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57. An event of similar magnitude to Hurricane Sandy is likely to affect Sea Bright in the next twenty years .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. An event of similar magnitude to Hurricane Sandy is never likely to affect Sea Bright again .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

This section asks you to imagine that if there were such an event within the next ten years, what sort of impacts you would expect.

	Not Likely At All	Not Very Likely	Somewhat Likely	Very Likely
59. Likelihood of major damage to your home.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60. Likelihood of injury to you or members of your household.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
61. Likelihood of health problems to you or members of your household.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Lastly, we would like to ask you some questions about yourself, your household, and for some closing comments.

62. What is your age (in years)?

_____ years old

63. What is your job or profession?

64. How many **adults** live in your home (individuals over the age of 17)?

65. How many of those adults are **seniors** (individuals over the age of 64)?

66. How many **children** currently live in your home (individuals 17 years old or younger)?

67. What was your total household income before taxes for **the year 2011** (the year prior to Hurricane Sandy)?

- | | |
|---|--|
| <input type="checkbox"/> Less than \$20,000 | <input type="checkbox"/> \$80,000-\$99,999 |
| <input type="checkbox"/> \$20,000-\$39,999 | <input type="checkbox"/> \$100,000-\$199,999 |
| <input type="checkbox"/> \$40,000-\$59,999 | <input type="checkbox"/> \$200,000 and up |
| <input type="checkbox"/> \$60,000-\$79,999 | |

68. What was your total household income before taxes for **the year 2013** (the year after Hurricane Sandy)?

- | | |
|---|--|
| <input type="checkbox"/> Less than \$20,000 | <input type="checkbox"/> \$80,000-\$99,999 |
| <input type="checkbox"/> \$20,000-\$39,999 | <input type="checkbox"/> \$100,000-\$199,999 |
| <input type="checkbox"/> \$40,000-\$59,999 | <input type="checkbox"/> \$200,000 and up |
| <input type="checkbox"/> \$60,000-\$79,999 | |

69. What is your sex?

- Male
 Female

70. What is your race?

- | | |
|---|--|
| <input type="checkbox"/> White | <input type="checkbox"/> Asian |
| <input type="checkbox"/> Black or African American | <input type="checkbox"/> American Indian |
| <input type="checkbox"/> Other (please specify) _____ | |

71. What is the highest degree or level of school you completed? If currently enrolled, mark the previous grade or highest degree received.

- | | |
|--|---|
| <input type="checkbox"/> Kindergarten through 8 th grade | <input type="checkbox"/> Bachelor's Degree (BS, BA, etc.) |
| <input type="checkbox"/> 9 th grade through 11 th (no diploma) | <input type="checkbox"/> Master's Degree (MS, MA, etc.) |
| <input type="checkbox"/> High school diploma or GED | <input type="checkbox"/> Professional Degree (MD, JD, etc.) |
| <input type="checkbox"/> Technical School | <input type="checkbox"/> Doctoral Degree (PhD) |
| <input type="checkbox"/> Some College or Associates Degree (AA) | |

