

University of Delaware  
Disaster Research Center

MISCELLANEOUS REPORT #77

HOUSEHOLD RESIDENTIAL  
DECISION-MAKING IN THE  
WAKE OF DISASTER:  
REPORT OF RESULTS PREPARED FOR  
SEA BRIGHT RESIDENTS

Sue McNeil  
Joseph Trainor  
Alex Greer  
Kelsey Mininger

2015



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REPORT OF RESULTS

PREPARED FOR SEA  
BRIGHT RESIDENTS

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Prepared By:

Sue McNeil, Ph.D.  
Professor, University of Delaware  
Disaster Research Center

Alex Greer, Ph.D.  
Research Assistant, University of Delaware  
Disaster Research Center

Joseph Trainor, Ph.D.  
Assistant Professor, University of Delaware  
Disaster Research Center

Kelsey Mininger  
Undergraduate Student, University of  
Delaware  
Disaster Research Center

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Questions regarding this report or the study may be directed to Alex Greer, 166 Graham Hall, Newark, DE, 19716. Alex may also be reached by telephone at (302) 831-6618 or via e-mail at [AGreer@udel.edu](mailto:AGreer@udel.edu).

## EXECUTIVE SUMMARY

This report presents the findings of a questionnaire mailed to Sea Bright residents during the summer of 2014 focusing on housing damage, decisions, and repair following Hurricane Sandy. Researchers at the Disaster Research Center at the University of Delaware worked together with the Borough of Sea Bright to complete this study. As researchers, we were interested in exploring both the condition of the housing stock and the different elements that influenced how Sea Brighters decided where to live after Sandy. Little research exists to help explain how households decide where to live after a disaster. Getting better information about how people here made and are making these decisions is important both for this community and for communities that will face these kinds of disaster in the future. We hope that this information will lead to better policies and programs that improve the disaster recovery process.

We began working with the Borough of Sea Bright after we visited the town in November of 2013. While we were guests in the area, the town leadership presented a plan for what their town would look like in year 2020, and noted that they needed to know about the condition of the housing (damage, occupancy, etc.) following Hurricane Sandy. After conversations with the local leadership, we began developing a mail questionnaire in early December to help the government get the information they needed and let us explore how residents decided where to live after Sandy.

We mailed the questionnaire to Sea Bright residents during the summer of 2014. The questionnaire asked about a number of issues, including whether they had fully repaired their homes or not, if they had raised their homes or made them safer in any other way, if they had moved or if they planned to move in the near future, if they were concerned about future storms like Sandy, and for general information about themselves and others that lived in their home. We mailed questionnaires to 1252 addresses in Sea Bright and received 303 completed questionnaires. After removing invalid addresses from our database, we had an approximately 30% response rate. While this may seem like a small number of people that level of response is typical for scientific questionnaires. In addition to the questionnaire, we also interviewed five households in person and nine over the telephone. These interviews provided us with more details about their recovery after Sandy.

When we examined the completed questionnaires and looked for themes in the interviews, we found a number of interesting patterns, applicable to both the town's needs and our research. A majority of questionnaire participants were full-time residents of Sea Bright, lived in condominiums or townhomes, and had completed any necessary repairs on their homes. A portion of residents still had ongoing repairs, and others had plans to make their homes safer in the future that they are still working to finance. We found that a number of factors influenced how Sea Brighters decided where to live after Sandy, including their financial situation, how attached they felt to Sea Bright, how much damage their home sustained from Sandy, how concerned they were about future storms, and their experiences during the recovery process. This report provides additional details on all of these factors. We hope that the people find these results interesting and that those who can make decisions to improve the lives of the people effected by disasters use this information to reach that goal.

## INTRODUCTION

On October 29, 2012, Hurricane Sandy made landfall on the northeastern U.S. coastline, damaging hundreds of thousands of homes and causing extensive damage to electrical lines, roads and bridges, and sewer systems. Sandy's tropical storm-force winds stretched over 900 miles, causing storm surges and destruction over a large area. According to the National Oceanic and Atmospheric Administration (2014), Sandy resulted in 159 deaths in the United States, thirty-four of which occurred in New Jersey.

Of the many areas affected by Hurricane Sandy, communities along the coast of New Jersey suffered some of the most devastating effects. Hurricane Sandy made landfall approximately eighty-seven miles south of Sea Bright, bringing with it a thirteen 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 the U.S. Office of Housing and Urban Development (2014), Hurricane Sandy damaged 720 structures in Sea Bright, flooding 376 structures with up to four feet of water and an additional 215 with over four feet of water. All of the businesses temporarily shut down following the storm, the town was unsafe for weeks due to gas leaks, and three quarters of the homes were uninhabitable (Brady 2013).

Disasters like Hurricane Sandy cause individuals, households, communities, and government to rethink the protections in place for lives and property. While recent events like Hurricane Katrina, the Indian Ocean Tsunami, and the earthquake, tsunami, and radiological event in Japan have brought more attention to disaster recovery, researchers still lack a good understanding of the disaster recovery process, especially when considering how people decide where to live after a disaster.

The purposes of this study were to provide details on the condition of the housing stock in Sea Bright for local officials and gain insights on how households decided to rebuild in the same spot or move following a disaster. We begin this report by discussing the status of the housing stock in Sea Bright. Next, we summarize the findings of other studies that explored how people decided where to live after a disaster that provided us with a foundation for our own study and detail our subsequent research approach. After that, we give an overview of our results. We close by discussing the conclusions we drew from our study.

## STATUS

Our questionnaire provided a summary of the amount of damage following Sandy and the status of the housing recovery. Table 1 shows the amount of damage reported. The majority of respondents reported *Somewhat Extensive* or *Very Extensive* damage. Only 2% of respondents abandoned their property. About 72% of respondents had flood insurance.

**Table 1: Reported Extent of Housing Damage**

<b>Damage</b>	<b>Number of Respondents</b>	<b>Percentage of Respondents</b>
<i>No Damage</i>	20	6.6
<i>Not Very Extensive</i>	73	24.1
<i>Somewhat Extensive</i>	113	37.3
<i>Very Extensive</i>	93	30.7
<i>Total</i>	299	98.7
<i>Missing</i>	4	1.3

Our questionnaire responses are consistent with Federal Emergency Management Agency (FEMA) data reported in Table 2 (FEMA-MOTF 2014).

**Table 2: Damage Reported by FEMA-MOTF Report**

<b>Damage</b>	<b>Number of Respondents</b>	<b>Percentage of Respondents</b>
<i>Affected</i>	22	12.2
<i>Minor</i>	86	47.8
<i>Major</i>	69	38.3
<i>Destroyed</i>	3	1.7
<i>Total</i>	180	100

Table 3 shows the status of the housing recovery as of June 2014. Over 15% of respondents indicated that repairs were still in progress or repairs were scheduled to begin.

**Table 3: Status of Housing Recovery, June 2014**

	<b>Number of Respondents</b>	<b>Percentage of Respondents</b>
<i>Abandoned</i>	7	2
<i>Repairs Completed: Not Elevated</i>	215	60.2
<i>Repairs in Progress</i>	48	13.4
<i>Structure was or will be totally rebuilt</i>	19	5.3
<i>Structure was or will be demolished</i>	30	8.4
<i>Repairs completed; elevated</i>	14	3.9
<i>Repairs scheduled to begin</i>	7	2



<i>Property for sale or sold</i>	32	9
<i>Prefer not to answer</i>	2	0.6
<i>In good condition (did not require repairs)</i>	39	10.9
<i>Not sure (please explain)</i>	15	4.2

Many homeowners have undertaken or are planning actions to mitigate the impact of future storms. Table 4 and Table 5 summarize the actions taken and the actions plan and how these actions have or will be funded. More than 50% of respondents have not undertaken any mitigation actions. The most common action was to elevated utilities. The most common funding mechanism was personal funds or savings.

**Table 4: Mitigation Actions**

<b>Activities and Funds</b>	<b>Specific Actions and Sources of Funds</b>	<b>Number of Respondents</b>	<b>Percentage of Respondents</b>
<i><b>Property Mitigation</b></i>	<i>Purchased additional insurance</i>	42	11.8
	<i>Elevated your home</i>	21	5.9
	<i>Installed hurricane windows</i>	18	5.0
	<i>Strengthened attachment to foundation</i>	26	7.3
	<i>Elevated utilities</i>	86	24.1
	<i>Installed roof fasteners</i>	14	3.9
	<i>Installed new pilings</i>	14	3.9
	<i>None of the above</i>	180	50.4
	<i>Prefer not to answer</i>	11	3.1
	<i>Other</i>	53	14.8
<i><b>Mitigation Fund</b></i>	<i>Personal funds/savings</i>	152	42.6
	<i>Insurance</i>	127	35.6
	<i>Borrowed from friends/family</i>	15	4.2
	<i>Non-profit assistance/aid</i>	15	4.2
	<i>Other (please explain)</i>	20	5.6
	<i>Loans from a financial institution</i>	16	4.5
	<i>Government support</i>	21	5.9
	<i>Did not select anything</i>	133	37.3
	<i>Prefer not to answer</i>	12	3.4

The most common planning mitigation measure is to elevate the home. Again, this is mostly funded using personal funds or savings.

**Table 5: Mitigation Plans**

<b>Plans</b>	<b>Specific Actions and Sources of Funds</b>	<b>Number of Respondents</b>	<b>Percentage of Respondents</b>
<b><i>Mitigation Plans</i></b>	<i>Install storm shutters</i>	9	2.5
	<i>Purchase additional insurance</i>	16	4.5
	<i>Elevate your home</i>	38	10.6
	<i>Install hurricane windows</i>	6	1.7
	<i>Strengthen attachment to foundation</i>	11	3.1
	<i>Elevate utilities</i>	22	6.2
	<i>Install roof fasteners</i>	8	2.2
	<i>Install new pilings</i>	6	1.7
	<i>None of the above</i>	232	65.0
	<i>Prefer not to answer</i>	20	5.6
	<i>Other</i>	39	10.9
<b><i>Planned Mitigation Fund</i></b>	<i>Personal funds/savings</i>	58	16.2
	<i>Insurance</i>	24	6.7
	<i>Borrowed from friends/family</i>	3	0.8
	<i>Non-profit assistance/aid</i>	5	1.4
	<i>Other (please explain)</i>	13	3.6
	<i>Loans from a financial institution</i>	9	2.5
	<i>Government support</i>	26	7.3
	<i>Did not select anything</i>	226	63.3
	<i>Prefer not to answer</i>	30	8.4

## BACKGROUND

We built the questionnaire to include items other researchers who looked at past events noted as important. We reviewed over 70 documents (including books, peer-reviewed journal articles, and reports). These studies created the basis for our own work. We found the following six themes in these studies:

1. Households tend to rebuild in the same spot in the same way following disasters (Berke and Campanella 2006; Dynes 1991:11; Haas, Kates, and Bowden 1977; Oliver-Smith 1996:308),
2. Households that feel strongly attached to where they live are more likely to rebuild in the same place than residents that do not feel the same level of attachment to their community (Cuba and Hummon 1993; Fraser *et al.* 2003; White, Virden, and Riper 2007),
3. Households that suffer extensive damage are less likely to rebuild in the same place than residents that experience minimal damage (Emily and Storr 2009; Miller and Rivera 2007; Myers, Slack, and Singelmann 2008; Wilson and Stein 2006),
4. Households that are more concerned about another similar disaster are less likely to build in the same place than residents less concerned about another similar event (Slovic 1999; Kirschenbaum 2005),
5. A number of demographic characteristics may influence this decision, such as age, household income, and minority status (de Vries and Fraser 2012; Fraser *et al.* 2003; Weber and Peek 2012:16), and
6. Households with negative opinions of their community prior to the disaster are less likely to rebuild in the same spot than households that have positive opinions of their community (Castles 2002; Correa 2001; David and Meyer 1984).

To explore these themes within Sea Bright, we developed an academic case study, which is a research technique that uses different kinds of evidence to develop an overall understanding of a topic (Berg and Lune 2012:325). Appendix 1 provides more details about the methods we used for this study. In the pages that follow, we provide an overview of the results from these data collection efforts. The topics we focus on are demographics, attachment to Sea Bright, damage, disruption, risk perception and the housing recovery process. For each topic, we provide the following three sections: 1) by the numbers, 2) in your words (with quotes from the interviews and questionnaires in italics), and 3) take away.

## FINDINGS

### *Demographics*

Previous researchers have suggested that demographic characteristics (such as age, race, and income) might influence how someone decides where to live after a disaster. To explore this idea in Sea Bright, we included demographic questions on our questionnaire modeled after the American Community Survey; a survey ran by the U.S. Census Bureau. Specifically, we asked Sea Brighters to share their age, job or profession, household makeup, household income pre- and post-Sandy, gender, race, and education level.

As part of our questionnaire, we also included questions about resident's homes. As mentioned earlier, the local government was interested in learning about the condition of the housing stock in the wake of Sandy, and we wanted a better idea of whom we were studying. Therefore, we asked residents about their tenure in the community, their housing type, the condition of their home after Sandy, and about any plans they might have for future protective measures.

### By the numbers

The average age of Sea Brighters that returned the questionnaire was sixty, with a majority of respondents over the age of fifty-four. Only 18% had children in their home under the age of eighteen, and 42% had seniors in their home over the age of sixty-four. The most common household size in Sea Bright had two members, and 30% of households reported only one person living in the home.

The average household income in Sea Bright among respondents was over \$99,999, both pre- and post-Sandy. On a surprising note, 11% of the sample reported in a lower income bracket post-Sandy. This does not necessarily mean their income dropped due to Sandy, but that their 2013 income was lower than 2011. Approximately 52% of respondents indicated they were male, and 93% identified as white. A majority of residents had a Bachelor's Degree, and 13% held a Professional Degree (MD, JD, etc.) or Doctoral Degree (PhD). Interestingly, we did not find any relationship between demographic factors and how someone decides where to live after a disaster.

Table 6 displays the questionnaire data compared to the Census data to show the similarities and differences between our sample and the Census profile for Sea Bright. In general, the data are similar. The biggest differences are in the average age of the respondents and household income. This is typical, however, within questionnaire research. Often, people that respond to questionnaires tend to be older than the average population, disproportionately female (which was not the case here), and of the racial majority.

**Table 6: Census Demographic Profile Compared to Questionnaire Data**

	<b>Census Data</b>	<b>Questionnaire Data</b>
<i>Median Age</i>	46	60
<i>Average Household Size</i>	2	2
<b><i>Percent of the Population Over the Age of 18 in Each Age Range</i></b>		
<i>20 – 24</i>	4.6%	0.7%
<i>25 – 34</i>	16.9%	3.8%
<i>35 – 49</i>	28.8%	15.2%
<i>50 – 64</i>	31.9%	40.5%
<i>65 &amp; over</i>	16.4%	39.8%
<i>Total</i>	98.7%	100.0%
<i>Missing</i>	2.3%	0.0%
<b><i>Sex</i></b>		
<i>Female</i>	48.0%	45.9%
<i>Male</i>	52.0%	51.5%
<i>Total</i>	100.0%	97.4%
<i>Missing</i>	0.0%	2.6%
<b><i>Race</i></b>		
<i>White</i>	94.4%	92.7%
<i>Black or African American</i>	1.0%	0.3%
<i>Asian</i>	2.2%	2.3%
<i>Other</i>	3.3%	1.7%
<i>Total</i>	100.0%	97.0%
<i>Missing</i>	0.0%	3.0%
<b><i>Household Income in 2011 (the year prior to Sandy)</i></b>		
<i>Less than \$100,000</i>	60.0%	35.4%
<i>\$100,000 or more</i>	40.0%	49.5%
<i>Total</i>	100.0%	84.9%
<i>Missing</i>	0.0%	15.1%
<b><i>Highest Level of Education Completed</i></b>		
<i>No diploma</i>	1.5%	0.7%
<i>High School Graduate (includes equivalency)</i>	19.1%	8.3%
<i>Some College or Associates Degree (AA)</i>	29.7%	19.8%
<i>Bachelor's Degree</i>	33.4%	33.7%
<i>Graduate or Professional Degree</i>	16.3%	34.7%
<i>Total</i>	100.0%	97.2%
<i>Missing</i>	0.0%	2.8%

Table 7 displays the residential profile for Sea Bright questionnaire respondents. A majority of our questionnaire respondents owned their home, and only 29% indicated that their home in Sea Bright was a second home. A majority of respondents (56%) lived in condominiums or townhouses, with single-family homes being the second-largest category (35%). The average respondent had lived in Sea Bright for thirteen years by the summer of 2014.

We also asked residents about their progress on home repairs, if they had done anything or had any plans to do anything to make their home safer in the future, and how they intended to finance this work. In general, 71% of respondents indicated that their homes were repaired or did not require repairs at all. In contrast, 13% of respondents were still repairing their homes, 8% demolished their homes, and 9% either sold their homes or had them on the market. A majority of respondents did not, and do not plan to, do anything else to protect their homes from a future hurricane. Approximately 24% of respondents indicated that they had elevated their utilities, and 12% said they purchased additional insurance. Of those with future protection plans, 11% still planned to elevate their homes as of the summer of 2014. A majority of respondents said that they paid for these expenses using their own personal funds or savings, followed by insurance.

#### In your own words

There is no “in your own words” section for this topic because, fortunately, Sea Brighters that returned their questionnaires and participated in interviews 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.

#### Take away

The discrepancy between the findings for this study and previous studies regarding the role demographics play when deciding where to live after a disaster is worth discussing, and could be due to a number of reasons. First, there was little variation in the demographic variables, both within questionnaire participants and in the population as a whole. This variation is required for many of the statistical tests we ran exploring demographic factors. Second, many of the other studies asked individuals about *their* moving behavior after disasters, where we argue they should have looked at *households*. We suggest, instead, that in the typical household the decision to move or stay is a negotiated, group decision, made by all the members of the household. We are not advocating that every household is a democracy, but we are arguing that you cannot reduce the decision to the choice of a single individual. Lastly, other studies might not measure all of the important factors. In other words, they might have missed some things that explain the differences in demographic factors. For example, imagine that researchers in another setting saw a pattern where young adults were more likely to move after an event than their older counterparts were, and concluded that age was a significant factor, and that younger people move out of the community more often than their older counterparts do after disasters. If they had conducted interviews, however, they may have found that the younger people moved because the schools that their children attended failed to re-open after the event. So in this case, they did not move because they were younger, but because the event resulted in a decreased quality of living for them, which did not affect their older counterparts that no longer had children in the home.

**Table 7: Residential Profile of Questionnaire Respondents**

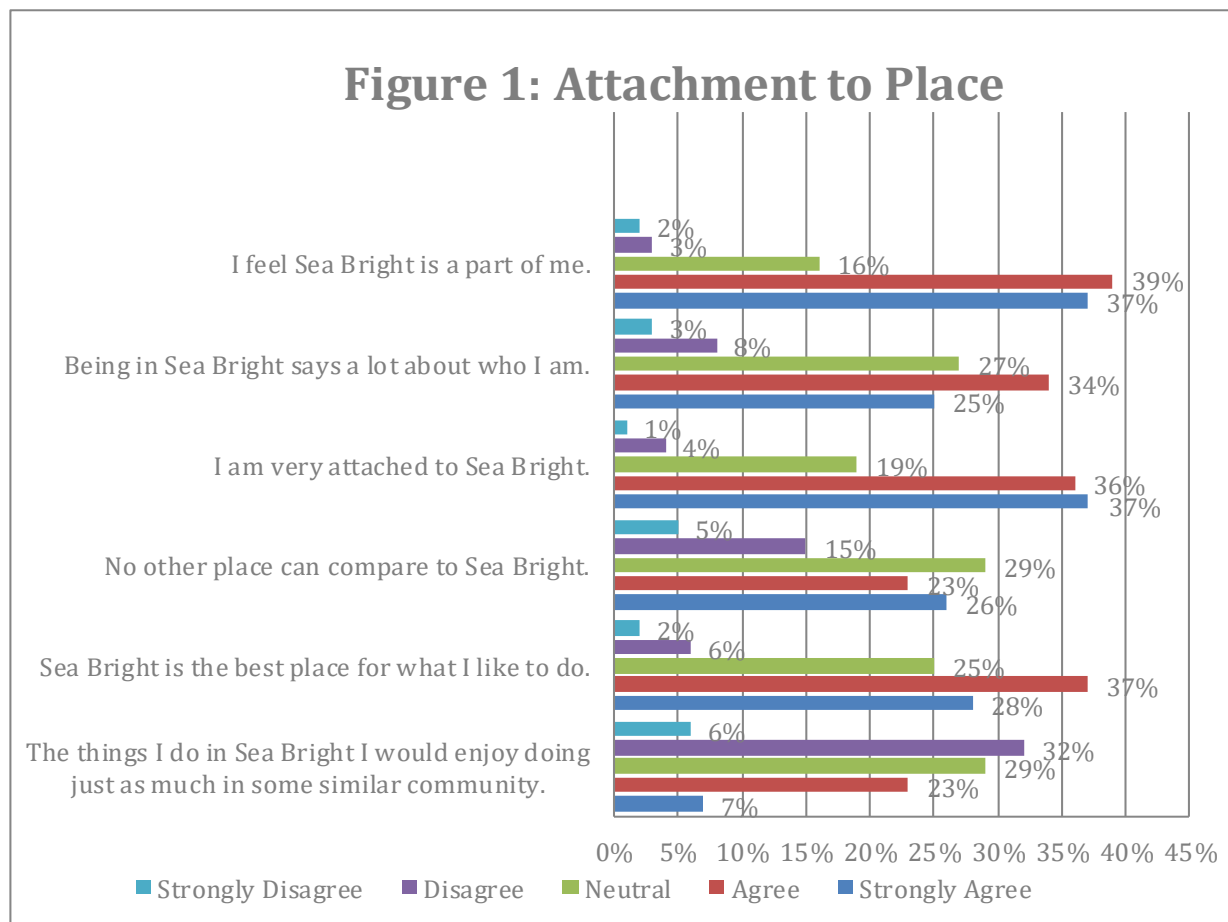
	Number of Respondents	Percentage of Respondents
<i>Residential Data</i>		
<i>Do you own or rent the property addressed on the envelope of this questionnaire?</i>		
<i>Rent</i>	30	9.9%
<i>Own</i>	273	90.1%
<i>Total</i>	303	100%
<i>Missing</i>	-	-
<i>Which of the following describes how you use this property? Mark all that apply.</i>		
<i>Primary Residence</i>	155	51.2%
<i>Second Home</i>	88	29%
<i>Rental Property</i>	27	8.9%
<i>Other</i>	4	1.3%
<i>Prefer not to answer</i>	2	0.7%
<i>Total</i>	276	91.1%
<i>Missing</i>	27	8.9%
<i>How long has this residence been owned by your family? Please answer in years.</i>		
<i>Median (years)</i>	12	
<i>What type of home is this?</i>		
<i>Single-family home</i>	107	35.3%
<i>Multi-family home</i>	12	4%
<i>Apartment</i>	9	3%
<i>Condo/Townhouse</i>	171	56.4%
<i>Other</i>	4	1.3%
<i>Total</i>	303	100%
<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>	2002	
<i>In total, how many years have you lived in Sea Bright?</i>		
<i>Median (years)</i>	13	

### *Attachment to Sea Bright*

The first element we explored was an idea called “attachment to Sea Bright.” This is an idea that explores how connected people are to where they live. Researchers typically break it down into two components. The first considers how much residents identify with where they live, their neighbors, and their history in an area. To put it another way, this component explores how emotionally attached someone is to where they live. The second factor explores how much residents depend on the qualities a place offers them that they enjoy, like access to the beach, public transportation, and privacy. We explored both components of attachment in three ways. First, we asked a panel of six questions related to attachment to Sea Bright on the questionnaire. Second, we asked residents to list the best and worst things about their community, both pre- and post-Sandy. Lastly, we asked interviewees to tell us about their communities, why they lived in Sea Bright, and what it was like both before and after Sandy.

#### By the numbers

In general, Sea Bright residents were highly attached to their community. A majority of Sea Brighters (61%) indicated that they were attached to their community. Of note, 37% of Sea Bright respondents felt strongly attached to Sea Bright, and 26% strongly agreed that no other place could compare to Sea Bright. Figure 1 displays the breakdown of attachment to place in Sea Bright.



**Figure 1: Attachment to Place**



### In your own words

When describing the three best and worst things about their community, both before and after Sandy, a few intriguing patterns emerged. We represented those patterns in Wordles. Wordles are “word cloud” figures that represent major themes in data by varying the size and boldness of the words based on how many times they appear in the text. Therefore, if a word is more common, it is both larger and bolder in the Wordle produced. Figure 2 displays the Wordle produced when examining what Sea Brighters liked most about their community pre-Sandy.



**Figure 2: Wordle Representing the Three Most Common Things Sea Brighters Liked Most about Their Community before Sandy**

As you can see in the figure above, Sea Brighters emphasized being close to the beach, the river, the small-town feel of the area, and the town’s proximity to other places (like Manhattan) as some of the elements they liked the most about the community prior to Sandy. Other notable elements include the local restaurants and bars, their ability to walk the town, and the downtown area. Many of the things Sea Brighters mentioned here relate to elements you would expect of a small, coastal community. Figure 3, in contrast, displays what Sea Brighters liked most about their community after Sandy.







**Figure 5: Wordle Representing the Three Most Common Things Sea Brighters Liked Least About Their Community after Sandy**

Interestingly, when considering which parts Sea Brighters liked least about their town after Sandy, the responses are quite different from what they liked least before Sandy. A number of Sea Brighters mentioned the pace of recovery (suggesting that it was slower than they desired), the loss of businesses, and issues they had with the local government during their household recovery effort. Where before Sandy residents suggested their proximity to other places was a great thing about living in Sea Bright, many residents suggested that they felt isolated following Sandy.

Even with these negative elements, a number of Sea Brighters told us during our interviews that they never considered moving. Not returning to their home was not an option. When asked what sort of situation would cause them to consider moving, interviewees would often respond that they could not imagine any such scenario.

*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 my house, I wouldn't leave my community, and especially after a devastation.*

Interviewees highlighted the importance of their house, their community, and hinted at the formation of new and stronger bonds in the area. 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. 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 stories, or simply being more apt to speak when they see each other.

*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 to, I guess we kind of formed a bond, some people that have been coming here or living here for a lot of years.*

Interviewees from Sea Bright spoke nostalgically about what their surroundings 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 downtown and to the beach. When discussing what made their community a special place to live, their affection for Sea Bright was apparent.

*There is no place like it in the world, I would say. It's, um, we talk about it all the times, it's like my life is other people's vacation.*

There were other interviewees, however, that did not share this post-event attachment to Sea Bright. A portion of Sea Bright interviewees suggested that Hurricane Sandy took away what tied them to their community. These interviewees highlighted the loss of businesses, the library, and other key landmarks that lowered their satisfaction with the area. Other interviewees mentioned factors, not linked to Sandy, which pushed them out of their pre-Sandy residence. Interviewees suggested rising taxes, the absence of programs and good schools for children, and the lack of a yard as reasons they intended to move out of Sea Bright before Sandy even hit. Many of these interviewees' homes, however, lost value during Sandy, and now feel they have to wait, hoping for the value to return, before they can consider leaving again.

#### Take away

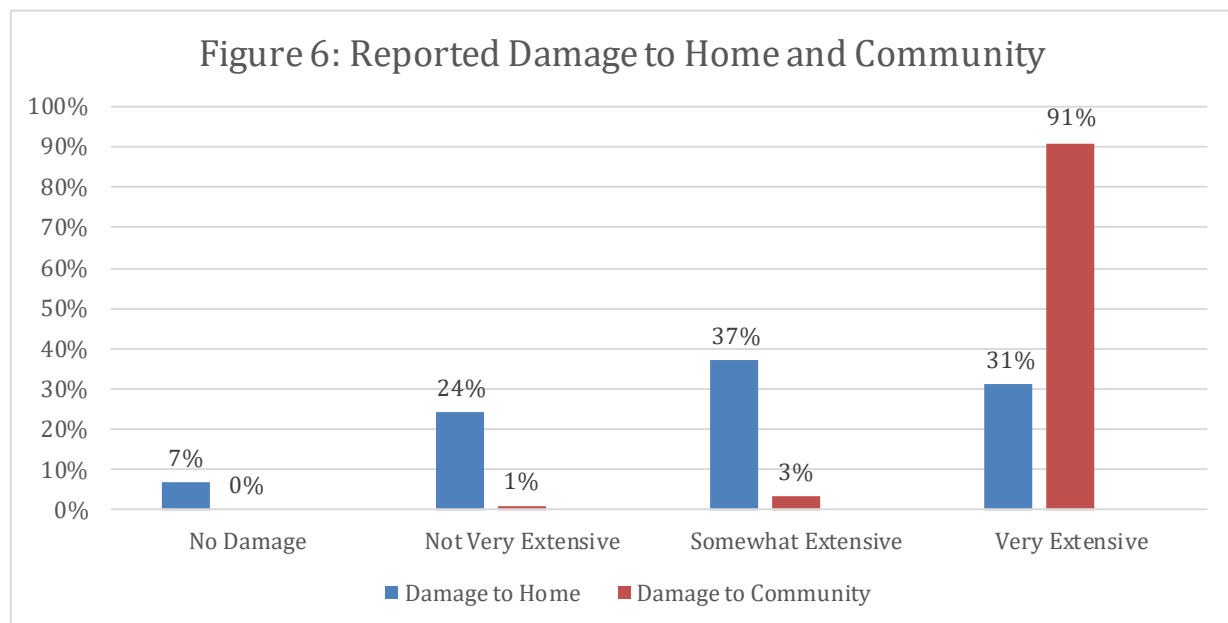
The questionnaire and interview data show that there is a relationship between attachment to place and the decision to stay or move after Sandy. Most notably, Sea Brighters that participated in the questionnaire that were more attached to Sea Bright were more likely to think they will live in Sea Bright 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. Interviewees also echoed this sentiment. We saw that a number of residents were happy with the community and never even considered moving, while others, often those that had considered moving before the storm, either had already moved or had plans to move in the near future. This suggests that future studies should avoid simply asking if people have moved and look at what people plan to do in the near future.

## Damage

Hurricane Sandy caused extensive damage to Sea Bright. To explore the range of damage and the perception of the damage in Sea Bright, we asked residents two sets of questions. One set of questions asked residents to tell us the amount of damage done to their home in dollars, whether they had flood insurance, and how much said flood insurance covered. A second set of questions asked residents to rank the damage done by Sandy to both their homes and their community from “not very extensive” to “very extensive”.

### By the numbers

In our study, the average damage residents reported to their home was \$93,000. Approximately 72% of respondents stated that they had flood insurance, and it covered \$53,000 on average in damages. A majority of respondents in Sea Bright felt that damage to both their homes and their communities was extensive. Interestingly, the average responding resident thought the damage was worse to the community than their own home. We found that, in general, respondents with extensive damage were more likely to move than respondents with less than extensive damage were. Figure 6 displays respondent’s impressions of damage to both their homes and their community.



**Figure 6: Reported Damage to Home and Community**

### In your own words

Since we asked residents during interviews to describe their experiences with Sandy, each one detailed the damage to their homes and their community. A few patterns related to damage emerged in these interviews. First, a number of interviewees in Sea Bright suggested that damage from Sandy led to a number of shops and services never returning to the area, which affected their happiness with the community and their desire to live in Sea Bright.

*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 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....*

Second, interviewees often discussed the rate of recovery in the community, suggesting that while they knew it was a challenging task, it was slower than they had anticipated.

*I think getting the money quicker or easier it's probably something that a lot of people would say. For me, I was giving up on a lot of the programs because they were difficult or time consuming and with everything else...and I know government moves slowly but I think when I think there are people, good people, through no fault of their own who are caught in some situation like this, you know, I think we all pay taxes and we all try to be citizens and I think that it would've been nice for the government to move a little faster and help the people a little bit more.*

### Take away

We found evidence in both the questionnaire data and through the interviews that residents considered the damage done to their homes and communities when deciding where to live after Sandy. Residents that thought that Sandy did more damage were more likely to move out of the community. Residents might have seen this damage as a chance to start in a new location, or as the start of an exhausting rebuilding process that they were not willing to endure. Interestingly, the average resident estimated damage to their community as worse than the damage to their own homes.

It is important to consider that while residents that lived in Sea Bright during Sandy understand some of the risks associated with hurricanes and living in Sea Bright, a number of residents are leaving the area, opening up space for new residents. Therefore, while Sea Bright still lives with the risk of future hurricanes, new Sea Brighters may not be aware of the destructive potential of these events, or how to adequately protect themselves and their homes. In the future, the local government should be sensitive to this risk and consider educational campaigns and other approaches to ensure that residents are equipped with the knowledge necessary to persist in the area. Existing community members should also consider what they could do to help bring their new neighbors up to speed on the risks, and strategies to address these potential issues.

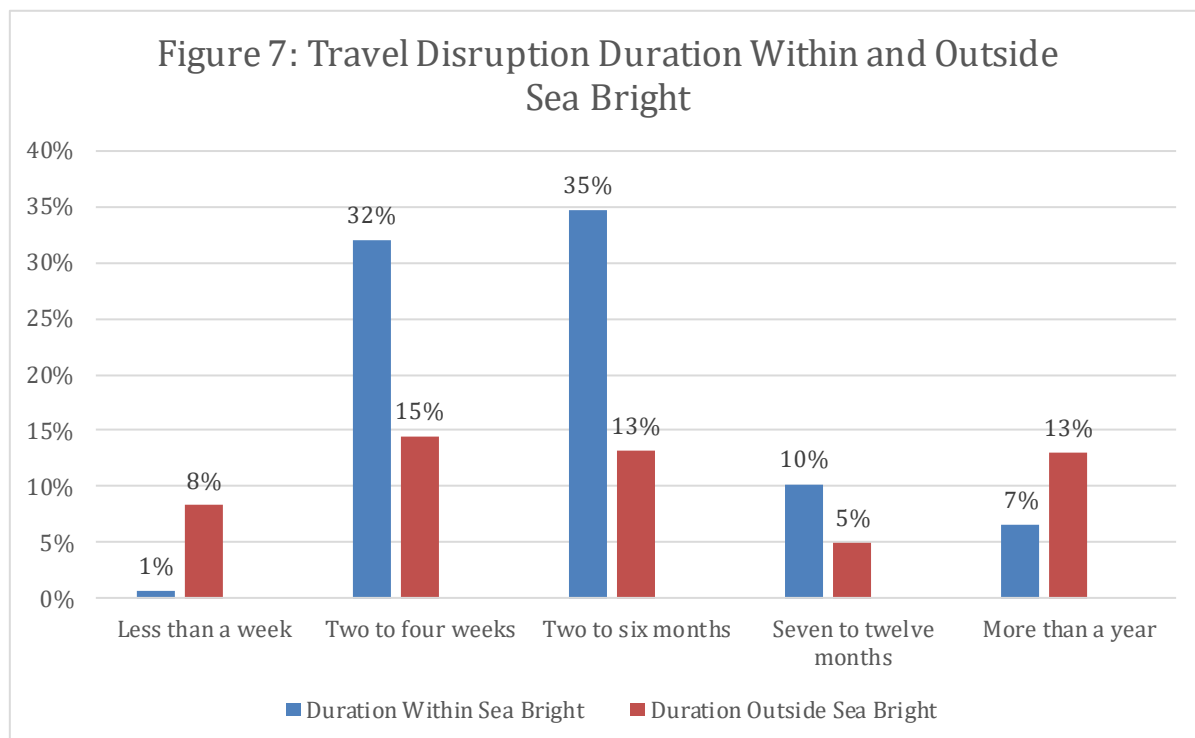
## Disruption

In addition to the damage Sandy caused, it also resulted in significant disruption to Sea Brighters ability to travel. While this is an area ignored by previous researchers, we thought it was important to include, given the fact that many Sea Brighters travel outside the area daily for work. To explore this idea, we asked residents whether Sandy disrupted their ability to travel both within and outside Sea Bright, and how long that disruption lasted.

### By the numbers

When asked about travel disruption within Sea Bright, 86% of respondents indicated that Hurricane Sandy did disrupt their travel, and a majority of Sea Brighters that returned the questionnaire indicated that Hurricane Sandy disrupted travel within Sea Bright for a period between two weeks and six months. Respondents indicated that traveling outside of Sea Bright, 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 54% of Sea Bright residents indicated that travel outside of their community was an issue. The length of outside travel disruption was also shorter, in general, than travel within Sea Bright.

This ability to travel both within and outside of Sea Bright was important to residents when deciding where to live after Sandy. Approximately 62% of Sea Bright respondents suggested that their ability to travel within their community was somewhat to very important in their decision-making process. Interestingly, respondents that perceived disruption outside Sea Bright were more likely to still live at their pre-Sandy address. When considering travel outside their community, 59% of Sea Bright respondents indicated that the ability to travel outside of Sea Bright was somewhat to very important in their decision-making process. Figure 7 displays respondent's reported travel disruption within and outside of Sea Bright.



**Figure 7: Travel Disruption Within and Outside Sea Bright**



### In your own words

Many residents mentioned that Sandy disrupted their travel during our interviews. They often suggested that, if they could even contact their employer to see if they were open, they had no way to get to work. If they could get to work, the market, or other places they travelled frequently, they noted that after Sandy it took much more time to get there.

*Um, [pause] they... well again, this area was so badly affected that, you know, even going inland, some of the stores that were you know, 15-20 minutes away, they would be open for a few hours, running on generators. Um, a lot of trees down. It took me a few days to get to my office. I don't know, that was one area where we kind of made do.*

*It added another 45 minutes [to their work commute]. Yeah, it was taking me close to three hours each way to get in and out cause I [laugh] well... You know, I had to keep my job... I had no choice.*

When discussing disruption, interviewees often noted that while it was anywhere from difficult to impossible to get to work, their job was accommodating in light of what had happened. This was important to them, because work offered them a sense of normalcy. Many interviewees noted that they could work remotely once they found a location with electricity and internet access.

*I have a laptop, so I can work from home. It wasn't an issue. You know I could work. As long as I had power and it was charged. I was still able to work so that was fine.*

### Take away

Disruption, or interruptions in the ability to travel, returned mixed results. It is not surprising that, given the level of damage in the area, that such a high percentage of Sea Brighters would note disruption to travel after Sandy. Given that over half the residents noted that their ability to travel, both within and outside of Sea Bright, was an important factor when deciding where to live after Sandy, officials should consider prioritizing the restoration of roads, bridges, and public transportation after an event if their goal is to encourage residents to return to their homes.

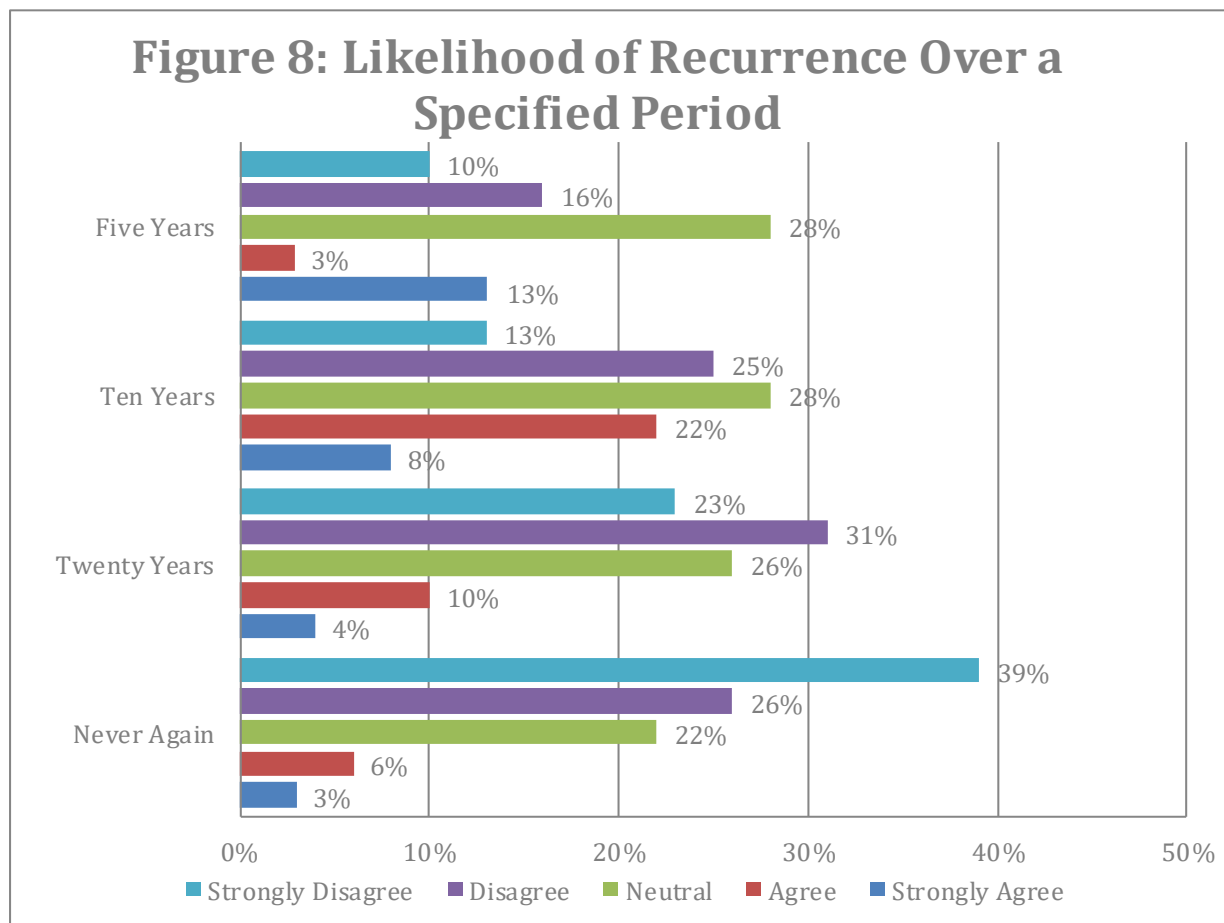
Interestingly, Sea Brighters that perceived travel disruption outside of their community were more likely to have rebuilt in Sea Bright. This does not necessarily suggest that the disruption to travel outside of Sea Bright made them want to rebuild. Rather, it might indicate that residents that rebuilt actually lived through the disruption and therefore rated it as higher than people that had already left.

### *Risk Perception*

Since previous studies found that residents that were more concerned about future disasters were more likely to move after a disaster, we wanted to explore this topic in Sea Bright. To that end, we asked questionnaire respondents a panel of questions that touched on the chance of a similar event occurring over a given timeframe, the potential impacts of such an event, and the importance of these potential events on where they decided to live after Sandy.

#### By the numbers

In Sea Bright, a majority of respondents did not think another event like Hurricane Sandy was likely within the next twenty years. Only 10% of respondents strongly agreed that an event of similar magnitude to Hurricane Sandy was likely to affect their community in the next five years. We found that residents that thought another event like Sandy was likely in the next five years were more likely to plan to move out of Sea Bright in the next five years than residents that thought a repeat of Sandy was less likely. When looking at a longer time horizon, however, over 60% of respondents indicated that they believe an event like Hurricane Sandy will affect their area ever again. Figure 8 presents resident's perceived likelihood of another event like Sandy over a specified period.



**Figure 8: Likelihood of Recurrence over a Specified Period**

When asked to consider what would happen if another event like Sandy occurred again in the next ten years, 28% of Sea Brighters said they thought it would cause major damage to their home, whereas only 5% thought they, or members of their household, would suffer injury or health problems for said event. We found that respondents that thought that a repeat event would cause major damage to their home or might cause them or their household injuries were less likely to live at the same address and more likely to want to move out of the area in the next five years than respondents that thought major damage or injury was unlikely.

Interestingly, only 14% of Sea Bright respondents suggested that the likelihood of another event like Sandy was very important when deciding where to live after Sandy. We also found that respondents that thought a similar event might occur within the next five years or that a similar event would cause health problems for their household were more likely to plan to leave Sea Bright in the next five years when compared to respondents that thought recurrence was less likely.

#### In your own words

During conversations, interviewees offered a number of insights on what they thought about future hurricanes and how that influenced where they lived after Sandy. When asked if they felt safe, many interviewees responded by discussing their safety from robberies or other, non-hazard related risks. When we asked about their safety from future hurricanes, many residents suggested that they did not think they were at risk: they could simply leave the area before another hurricane arrived. When asked about the safety of their home, however, many interviewees confirmed that their home was still at risk from a future storm.

*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...*

This was not a universal view, however, and a group of Sea Bright interviewees indicated that the risk of a future event was too great, and they either had already moved or plan to move in the near future. These interviewees often suggested that they did not see Sandy as an isolated event, but rather the start of a new trend of damaging storms associated with climate change. Others argued that either as they aged or as they began their own family that the risk associated with future storms became more important when deciding where to live.

*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.*

Other interviewees suggested that they would never live to see another storm like Sandy again, arguing that it was an aberration, while some interviewees suggested that there is no truly safe place to live, so moving would not take them out of harm's way. 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 stated that Hurricane Irene had negligible effects on their area, and that Sandy, in

contrast, was what they considered the worst-case scenario. If Sandy set the standard, then they felt they were ultimately safe.

*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.*

### Take away

When considering how Sea Brighters understood the risk they live with, many of the patterns we saw are typical of what researchers have found in other communities after disasters. Residents often discount or downplay their own risk, but give accurate assessments when asked about their neighbor's risks. That is to suggest that they understand the risk, but do not believe the negative outcome will happen to them. Residents often even understand the risk to their homes and property, but disconnect that from risk to their person. They also typically will predict that events in the far future are likely, that another event of similar magnitude is unlikely in the near future, and will not adjust their behavior for the event they see in the future, which, in effect, discounts that future risk.

Given these findings, we found also found that, in general, Sea Brighters that participated in the questionnaire that thought a repeat event was more likely to occur were more likely to think they would move out of Sea Bright in the near future. Therefore, fear of a future hurricane served as motivation to move out of the area. While many respondents and interviewees suggested that they could not move immediately after the storm due to financial reasons, many that feared another storm planned to leave. Patterns in the interviews suggest that, as expected, risk was in the consciousness of Sea Brighters in the wake of Sandy. This is also evident in the Wordles, where many respondents noted hazard exposure as one of the worst things about Sea Bright, both pre- and post-Sandy. Many interviewees that relocated, or that had decided to relocate but were waiting to sell their home, emphasized the place a future storm held in their decision to leave the area. They would often acknowledge that this was a complicated decision, and that while they may feel attached to their community, the risk was too great for them to persist in Sea Bright.

### *Housing Recovery Process*

The last two questions on the questionnaire asked residents of Sea Bright to tell us, step-by-step, about their housing recovery experience and any problems or pitfalls they encountered while navigating this process. We also captured these experiences during our interviews with residents that both rebuilt in Sea Bright and that moved to new communities. In the sections below, we discuss a number of the themes that emerged in this set of questions.

#### Paperwork and ambiguity

It is easiest to convey the major themes that emerged in the open-ended questions and interviews by highlighting the language Sea Brighters used to describe their own housing recovery process. Overwhelmingly, the words Sea Brighters used portrayed a negative experience. Specifically, many respondents highlighted the paperwork associated with housing recovery as problematic, characterizing the paperwork as “difficult”, a “hassle”, “impossible”, “nightmare”, and “tedious”.

Respondents described the process as overburdened with unnecessary, difficult paperwork, unorganized, and lacking a clear path to completion. A number of respondents detailed the repetition in the process, noting that many times they would finish a form, only to have different organizations or aid applications require the same information later on. In other cases, respondents noted that organizations lost paperwork, or asked for the same form multiple times.

Respondents also reported that the process caused a lot of anxiety. Many residents told us they were wait-listed 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. Some respondents indicated that they submitted their aid application immediately after Sandy, and yet were still on the waiting list at the time we issued this questionnaire in the summer of 2014. The financial situation many residents found themselves in after Sandy only made the other hardships they faced even worse. A number of residents had to pay rent for a temporary place, land taxes, a mortgage, and repair costs while waiting to solidify their aid and loans.

It is difficult to overstate the stress residents reported with the short- and long-term recovery process. A number of residents spoke of the paralyzing anxiety that came with the paperwork, describing it as another full-time job or “the second disaster.” In interviews, a portion of respondents stated that this process was so tedious that they simply quit returning the paperwork.

Our interviews also revealed that interactions with different government agencies were generally unpleasant, and many residents perceived government workers as unsympathetic and insensitive. They felt as though the agencies, such as FEMA, were supposed to help them through this process, but in reality were less of an ally and more of a barrier to their housing recovery efforts.

*... 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”.*

The local government was also often the subject of discussion for Sea Bright residents. A number of respondents suggested that the demand overwhelmed a number of municipal services essential for recovery, such as the local building permit office. Without available staff to issue building permits, residents were unable to start their reconstruction in a timely manner.

### Coverage

A number of respondents encountered discrepancies when filing insurance claims in the wake of Sandy. Interviewees noted that when they contacted their insurance companies they were often surprised to find out there was a difference between what they thought their policies covered and what their insurance companies deemed as covered. A lot of this disparity centered on two items: what the insurance companies considered living space and therefore covered under flood insurance and the difference between flood damage and moisture damage.

### Positive assessments

While the themes that emerged from the questionnaire were overwhelmingly negative, there were some positive comments as well. A number of residents mentioned their experiences, and that of their neighbors, with the Resettlement Program. Through this program, the state of New Jersey offered homeowners \$10,000 in exchange for a commitment to stay in their current home for three years. This money was to help people fill in the gap where insurance and other aid was inadequate. In contrast to the many negative assessments of other sources of aid, interviewees often praised the Resettlement Program, noting that this source of aid was relatively easy to apply for and arrived relatively quickly.

A portion of respondents also gave positive assessments of the organizations and agencies working in the area, noting the critical role the aid played in their housing recovery. Some respondents applauded the efforts of individual members of the local government by name. Residents discussed the important role organizations like Sea Bright Rising and Catholic Charities played in their recovery effort, supplying rental assistance and other services essential in their recovery effort. A few respondents even mentioned that organizations like FEMA helped them out when it seemed like they had no one to turn to, meeting critical needs such as providing them with a hotel room for temporary living arrangements.

### Take away

An overwhelming portion of the open-ended questions on the questionnaire and the interview themes 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. 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. 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.

While this may appear a biased, negative view of the aid process, we took steps to attempt to balance our understanding of this process. To see extremes, we spoke to households that sustained a range of damages related to Sandy, from minor damage to complete losses. When we noticed the negative orientation of the data, we restarted our examination of the data, paying special attention to any positive assessments of the process. We completed a number of interviews with individuals involved in both the development and implementation of policies. While we were able to interview some members of government agencies, we made contact with a number of government agencies that either directly rejected our interview request or continually ignored our requests.

## CONCLUSIONS

We had two goals with this study. The first was to provide housing data for the Borough of Sea Bright. The second was to understand the factors Sea Brighters considered when deciding where to live after Hurricane Sandy. When it comes to housing data, we found that while much of the Sea Bright housing stock is repaired, there are still a number of needs. A portion of the residents never returned to the area, while others are still in the process of repairing their properties. A small segment of the population took measures to strengthen their homes for future storms, while others are still seeking funding and expertise to make their homes safer from future events. In short, while progress has been made, work is left to be done. To prevent damage like what happened from Sandy in the future, residents and the local government should consider community-wide mitigation efforts and methods to enable homeowners to receive additional funds for household mitigation projects.

When considering the factors that affect how a household decides to rebuild or move after Sandy, we found that attachment to Sea Bright, the level of damage to the home and community, travel disruption, level of concern about a subsequent hurricane, and both feelings about Sea Bright before Sandy and experiences after Sandy influenced how residents decided where to live after Sandy. Typically, residents suggested that a number of these factors identified above influenced their decision, and the choice of where to live rarely ever boiled down to one factor. While a number of other studies suggested that demographic factors affected this decision, we did not find evidence to support this claim.

Interestingly, we found that a household's financial situation disempowered them in this decision-making process. Many residents suggested that they could not afford to walk away from their homes and incur the remaining mortgage, but in its current condition the house lost much of its worth. So, in this situation, often the only affordable housing Sea Brighters recognized was to continue working toward repairing their current home, whether that meant incurring new debt or tapping into retirement funds, creating new uncertainties for themselves in the future. 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 was a largely understudied area in past work, and one that should be given more attention in future studies.

While residents and the community will feel Sandy's impacts for years to come, there is a lot to celebrate in the area. A number of residents noted that they felt that, in the wake of Sandy, their bonds with their neighbors strengthened. Sea Bright Rising, a grassroots nonprofit, emerged to help meet local needs. Residents successfully solicited Train to play a benefit concert for the town, and Benjamin Moore repainted the downtown and created a mural to commemorate the event. The town used Sandy as an opportunity to develop a vision for the area by year 2020. While the damage was extensive, many Sea Brighters are back in their homes, and almost three quarters of the residents either did not need any repairs or have already completed them.



## REFERENCES

- 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.
- Brady, Jeff. 2013. "After Sandy, Can the Jersey Shore Come Home Again?" *NPR*. Retrieved October 10, 2014 (<http://www.npr.org/2013/01/03/168556442/after-sandy-can-the-jersey-shore-come-home-again>).
- Castles, Stephen. 2002. *Environmental Change and Forced Migration: Making Sense of the Debate*. Vol. 70. The United Nations Refugee Agency.
- Center for Disease Control. 2013. "Deaths Associated with Hurricane Sandy – October-November 2012." Retrieved on March 10, 2015 (<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6220a1.htm>).
- Chamlee-Wright, Emily 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.
- Correa, Elena, Fernando Ramirez and Haris Sanahuja. 2011. "Populations at Risk of Disaster: A Resettlement Guide." The World Bank.
- Cuba, L. and D.M. Hummon. 1993. "A Place to Call Home: Identification with Dwelling, Community and Region." *The Sociological Quarterly*. 34:111-31.
- 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.
- Dynes, Russell. 1991. "Disaster Reduction: The Importance of Adequate Assumptions about Social Organization." Disaster Research Center Preliminary Paper.
- FEMA-MOTF. (2014). Hurricane Sandy Impact Analysis. Retrieved from [https://content.femadata.com/MOTF/Hurricane\\_Sandy/FEMA%20MOTF-Hurricane%20Sandy%20Products%20ReadME%20FINAL.pdf](https://content.femadata.com/MOTF/Hurricane_Sandy/FEMA%20MOTF-Hurricane%20Sandy%20Products%20ReadME%20FINAL.pdf)
- Fraser, James, Rebecca Ellmore, 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.

- Haas, John Eugene, Robert W. Kates and Martyn J. Bowden. 1977. *Reconstruction Following Disaster*. Cambridge, Massachusetts: MIT Press.
- Housing and Urban Development. 2014. "Sandy Damage Estimates by Block Group." Retrieved October 10, 2014 ([http://www.huduser.org/maps/map\\_sandy\\_blockgroup.html](http://www.huduser.org/maps/map_sandy_blockgroup.html)).
- Kirschenbaum, Alan. 1996. "Residential Ambiguity and Relocation Decisions: Population and Areas at Risk." *International Journal of Mass Emergencies and Disasters* 14(1): 79-96.
- Kraft, Michael and James Furlong. 2009. "Public Policy: Politics, Analysis, and Alternatives (3<sup>rd</sup> edition)." Washington, D.C.: CQ 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.
- 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.
- National Oceanic and Atmospheric Administration: National Climatic Data Center. 2014. "Billion-Dollar Weather and Climate Disasters: Table of Events." Retrieved on March 17, 2015 (<http://www.ncdc.noaa.gov/billions/events>).
- Oliver-Smith, Anthony. 1996. "Anthropological Research on Hazards and Disasters." *Annual Review of Sociology*. 25:308-28.
- Slovic, Paul. 1999. "Trust, Emotion, Sex, Politics, and Science: Surveying the Risk-Assessment Battlefield." *Risk Analysis*. 19(4):689-701.
- 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](http://www.nj.com/monmouth/index.ssf/2012/11/hurricane_sandy_aftermath_photos_sea_bright_residents-return_home_to_devastation_but_also_progress.html)).
- 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.
- Wilson, Rick and Robert Stein. 2006. "Katrina Evacuees in Houston: One-Year Out." National Science Foundation. Retrieved October 9, 2013 ([http://bri.rice.edu/Katrina/White\\_Paper\\_9\\_8\\_06.pdf](http://bri.rice.edu/Katrina/White_Paper_9_8_06.pdf)).
- Weber, Lynn and Lori Peek. 2012. *Displaced: Life in the Katrina Diaspora*. Austin: University of Texas Press.

Yin, Robert. 2009. *Case Study Research: Design and Methods*. Thousand Oaks: Sage Publications.

# Appendix 1: METHODOLOGY

## *Case Study Development*

To develop an understanding of how households decided where to live after Hurricane Sandy, the research team developed case studies. A case study is a research method that utilizes multiple sources of data to create an in-depth and detailed examination of an event (Berg and Lune 2012:325). We used three data sources to form an understanding of how households decided to either relocate or stay and rebuild:

1. A systematic review of policy documents,
2. Interviews with households, and
3. Interviews within the local, state, and federal government.

We analyzed each data source to create an overall picture of the elements influencing the decision-making process.

To understand how households decided to relocate or rebuild, we needed to examine one case where a majority of the community decided to rebuild in the same place and another case where an overwhelming majority of the community members decided to resettle. Ideally, the communities would be comparable but not identical, allowing us to explore those differences in the case study development (Yin 2009).

We chose Sea Bright, NJ, as one of our two communities for a couple of reasons. First, media reports and preliminary site visits indicated that a majority of the residents were returning to the area. Second, by working in Sea Bright we were able to collaborate with the local government and provide them amalgamated data on the community level they required for recovery efforts. Oakwood Beach in Staten Island, NY, served as our comparison site due a housing buyout program instituted by New York State that led to a majority of the residents leaving their community.

## *Policy Review*

To develop a more comprehensive understanding of policy associated with post-disaster recovery, we conducted a policy review. By policy, we are referring to “a course of government action or inaction in response to public problems” (Kraft and Furlong 2009). We conducted a systematic review of policy documents, including current federal policies on post-disaster recovery and state-level plans for federal funds dispersed following Hurricane Sandy.

## *Questionnaires*

In November of 2013, a preliminary site-evaluation trip to Sea Bright serendipitously aligned with a Sea Bright 2020 meeting. At the meeting, Boro government mentioned that they needed updated housing data following Hurricane Sandy to assess the current state of the housing stock and needs within the community. Questionnaire development began as a joint effort with the Boro of Sea Bright in early December. The questionnaire underwent several rounds of revision before deployment.

Questionnaires serve as a practical research method because they are relatively affordable and can collect a large sum of information across a variety of different topics. We mailed a self-administered questionnaire via the United States Postal Service to residents of both case sites.

On April 29, 2014, we sent each household on the mailing list a postcard to inform them of the study and provide them with contact information of the researchers in case they had any questions about the research. Three waves of the questionnaire packets followed the postcards. Before each round, we removed households from the mailing list that had already returned the questionnaire and packets that USPS could not deliver. In total, we received 303 questionnaires from residents of Sea Bright, which results in a response rate of approximately 30%.

The questionnaire contained 75 questions pertaining to the respondents' homes and their actions following Hurricane Sandy. We used multiple question types, including Likert and open-ended questions, to explore these issues. It consisted of twelve separate content sections, each intended to elicit responses on a different concept of interest to the research team and/or the Boro of Sea Bright. These sections included:

1. General residential data,
2. Place identity and place dependence,
3. Pre-event functioning and place attachment,
4. Condition of housing and mitigation plans,
5. Damage and insurance coverage,
6. Travel disruption,
7. Residential status and plans,
8. Variables influencing residential decision-making,
9. Post-event functioning,
10. Risk perception,
11. Demographics, and
12. Open-ended questions regarding the process of housing recovery and pitfalls associated with that process.

We chose these areas to explore based on findings of previous studies and Boro government needs.

### *Interviews*

To expand upon the information gathered from the questionnaires we conducted in-depth, semi-structured interviews. Interviews are a great way to gain a fuller understanding of variation within the decision-making process. We developed interview questions as a way to guide the flow of conversation, but often the interviews emerged organically and new questions developed as the interviewee shared their experiences.

We interviewed a variety of individuals, including both full-time and part-time residents, homeowners and renters, and households that rebuilt in Sea Bright and households that relocated to other communities. This rich variety of interviewees gave us an invaluable set of insights on the experience of Sea Bright residents in the wake of Hurricane Sandy. We only contacted interviewees if they indicated on the questionnaire that they were interested in talking to us, and all interviewees were 18 years of age or older.

In total, we conducted five face-to-face interviews in Sea Bright, one with a married couple and the remaining four with individuals. In addition, we interviewed nine additional residents via telephone that were unable to make the in-person interviews. We explored similar ideas in both the interviews and questionnaire. The interviews served as a way for us to understand the context within which households made their residential decisions, and learn about the struggles they encountered as they navigated their road to housing recovery.

### Limitations

It is important that we acknowledge the limitations to this study to help with interpretation of our findings. Since this study was exploratory, we did not perform higher-level statistical analyses that might have shed more light on the factors that influence how households decided where to live. Anytime researchers use a mail questionnaire, their database of addresses is inevitably not perfect, 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.

There is also always a concern when you ask people after an event to tell you about the time before the event. Without the foresight to perform this questionnaire and interviews before Sandy (or a time machine), this problem cannot be addressed, but only considered when interpreting findings.

We sensed, and patterns in the data suggested, that there was conflict among the residents and between a portion of the residents and the local government in Sea Bright following Sandy. At times, residents contacted us to voice their opinions, which were often counter to the results of the questionnaire, but they refused to participate in the study due to a fear of retaliation. By not capturing these opinions, this may lead to a dataset that potentially and probably portrays a much rosier picture than reality reflects.