

Resilience and Postdisaster Relocation: A Study of New York's Home Buyout Plan in the Wake of Hurricane Sandy



**Sherri Brokopp Binder, MA
University of Hawai'i at Mānoa**

August 2013

Report prepared by:

Sherri Brokopp Binder, MA
Doctoral Candidate, Community & Cultural Psychology
University of Hawai'i at Mānoa
Phone: 617 817 8340
Email: brokopp@hawaii.edu

Report prepared for:

Quick Response Grant Program
Natural Hazards Center
University of Colorado at Boulder

This research was funded in part by a grant from the University of Colorado Natural Hazards Center through its Quick Response Grant Program, which is funded by National Science Foundation grant number CMMI1030670. Additional funding was provided by the Department of Psychology at the University of Hawai'i at Mānoa.

Introduction

Natural disaster can have catastrophic impacts on communities. In the most severe cases, disaster survivors whose homes have been destroyed may choose or be forced to relocate. This is the decision facing many residents of New York whose homes or communities were damaged by Hurricane Sandy. Hurricane Sandy struck the east coast of the United States on October 29, 2012. The storm devastated coastal areas of New York, damaging or destroying an estimated 300,000 homes (10,000 of which were damaged by more than half their value) and claiming 60 lives in the state. Fourteen counties were declared federal disaster areas, and residents in the most heavily affected areas were without power for up to three weeks. (Associated Press, 2012; New York State Homes and Community Renewal, 2013; Russ, 2012). In the aftermath of this disaster, New York Governor Andrew M. Cuomo proposed a home buyout plan designed to permanently transform the state's coastal flood zones into preservation land (Kaplan, 2013; New York State Homes and Community Renewal, 2013). The buyout plan is one component of *Rebuild NY*, a broader initiative intended to strengthen and upgrade critical state systems and infrastructure.

The buyout includes a suite of buyout options for eligible homeowners. According to the plan, homes located within the 500-year floodplain would be offered pre-Sandy market value for their homes, and additional incentives would be available for homes in high risk communities, for communities that agree to relocate en masse, and for homeowners who relocate within the same county. Media reports indicate that residents have had mixed responses to the governor's plan. Some have voiced an eagerness to relocate, citing repeated damage from storms and flooding in recent years (Knafo, 2013). Others have expressed strong opposition (Roy, 2013).

The existing literature on home buyout plans suggests that several factors may influence the decision of whether or not to participate in a buyout program, including one's level of trust in those running the buyout program (de Vries & Fraser, 2012) and the degree to which the program is perceived as having actively engaged the community (Fraser, Doyle, & Young, 2006; Knobloch, 2009). Economic and social factors also play an important role (Fraser et al., 2006; Hunter, 2005). The process of relocating and, importantly, the interim period between the disaster event and final relocation, can have a number of negative consequences, including psychological distress (Blaze & Shwalb, 2009), medically unexplained physical symptoms (Yzermans et al., 2005), economic hardship (Hori & Schafer, 2009), and disruptions in social networks (Sanders, Bowie, & Bowie, 2003).

A number of important gaps remain in the disaster relocation literature, particularly related to the perceptions and impacts of home buyout programs. For example, we still know relatively little about why individuals choose to accept or reject buyout programs, and what individual and community level factors influence that decision. Few studies to date have explored the relationship between community resilience and relocation, particularly in the context of buyout programs. We also still have much to learn about the long-term implications of these decisions, both for those residents who choose to relocate and those who remain in their original community. Furthermore, no studies, to my knowledge, have been conducted in communities that rejected buyout plans that were offered to determine what factors influenced that decision. It is possible that these questions will be increasingly important to both researchers and practitioners as the

effects of climate change are felt in heavily populated areas (Scannell & Gifford, 2011), and more communities are faced with the prospect of relocation.

The present study addresses existing gaps in the disaster relocation literature by exploring the relationship between community resilience and relocation decisions related to New York's home buyout plan, which received federal approval on April 26, 2013 (Sullivan, 2013). Specifically, this study compares the experiences and perceptions of two coastal communities that were heavily impacted by Hurricane Sandy: Oakwood Beach on Staten Island, and Rockaway Park in Queens. Both communities are demographically similar and both face a similar threat level with regard to future disasters, yet these communities have responded very differently to the proposed buyout plan, with residents of Oakwood Beach enthusiastically pursuing the plan, while residents of Rockaway Beach are, largely, choosing to remain in their community. Using a mixed-methods approach that includes both a community survey and in-depth interviews with residents and community leaders, this study investigates what factors contribute to these differences.

The State of New York's Home Buyout Plan

New York's buyout plan, which is funded through \$1.71 billion in supplemental Community Development Block Grant (CDBG) funds, was approved by the US Department of Housing and Urban Development (HUD) on April 26, 2013 (Application & Requirements, 2013; Sullivan, 2013). New York's plan for the CDBG funds includes \$788 million for three housing related programs, collectively known as the "Recreate New York Smart Home Program" (State of New York, 2013). All three housing related programs are intended for owners of one- or two-unit homes (the plan includes additional provisions for owners of multiple unit dwellings). The first is the Recreate New York Smart Home Repair and Reconstruction Program. This program is designed for owners of one or two unit homes located outside of New York City to cover costs related to repair or replacements of property (including mold remediation and replacement of non-luxury property, such as home appliances). The second program, the Recreate New York Smart Home Resilience Program provides funds to mitigate homes located within a 100-year floodplain or that sustained damages greater than 50% of their pre-storm fair market value. This program provides funds to mitigate future damage to properties through changes such as raising the home above the base flood elevation level (it is estimated that raising a 1000ft² house by five feet will cost \$90,200).

The third program is the Home Buyout Program, which is the focus of this study. The Home Buyout is designed to offer homeowners 100% of the pre-storm fair market value for their homes if their homes are located within a 500-year floodplain and were damaged beyond 50% of their value. While participation in the buyout program is voluntary (as mandated by HUD), the state has included a number of additional incentives in the plan, with the goal of maximizing participation. These incentives include:

- 5% In-County Relocation Incentive: Homeowners who permanently relocate within the same county will receive an additional 5% of pre-storm FMV;
- 10% Enhanced Buyout Incentive: Offered to homeowners in designated high-risk areas (these areas are not defined);
- 10% Enhanced Group Buyout Incentive: Offered to clusters of homeowners in high-risk areas that collectively agree to participate in the buyout.

While these incentives are unique to New York's plan, the plan reflects standard CDBG funded buyouts in several ways. As required by HUD, all land purchased through the buyout must remain publically owned open space in perpetuity (in this case, they are to be maintained as coastal buffer zones). However, New York is seeking a waiver that would allow the state to redevelop properties outside of the 100-year floodplain, providing those properties are properly mitigated against future flooding. The plan also covers all costs typically associated with the sale of a property, including appraisal, survey, and title insurance. Funds provided through the plan cannot duplicate any other forms of assistance provided to homeowners, such as assistance provided through FEMA or insurance payouts. Finally, the plan states that household income may be used in determining eligibility for assistance under this category, or may, at a minimum, be required for reporting purposes for households assisted under the National Objective of urgent need. (New York State Homes and Community Renewal, 2013, p. 31) This statement may be interpreted as an effort at compliance with the CDBG objective of benefiting low- and moderate-income individuals. However, no specific income requirements are included in the plan.

The present study

The present study is a comparative, mixed-methods study of two communities that were affected by Hurricane Sandy and are eligible for New York's Home Buyout Program. With support from the Department of Psychology at the University of Hawai'i at Mānoa, this study has been expanded beyond the scope of the proposal originally submitted to the Quick Response Grant Program to serve as the author's dissertation research. This report reflects the preliminary findings from this study as it was presented in the Quick Response Grant application. Final results will be available once all data for the expanded study have been collected and analyzed.

The purpose of the present study is to compare the perceptions of and responses to the buyout plan in two heavily impacted coastal communities in New York, and to gain insight into what factors influence neighborhoods to support or reject the buyout plan. The first community, Oakwood Beach, is a residential neighborhood on the eastern shore of Staten Island. The second community, Rockaway Park, is located on the Rockaway Peninsula in Queens. Both communities suffered catastrophic damage from Sandy, including significant flooding and several fatalities. Both are also very vulnerable to damage from future hazard events. Both communities have also experienced a long history of disasters. While Hurricane Sandy was the most recent and most severe, both communities were also impacted by two major storms in 2011. Hurricane Irene was downgraded to a tropical storm just before making landfall in New York City on August 28, 2011. The storm caused major flooding and power outages on both Long Island and Staten Island (Dolnick, 2011). Less than two weeks later, Tropical Storm Lee dropped several more inches of rain in the area (Flegenheimer, 2011).

These two communities, in addition to sharing a history of natural disasters and a similar threat level for future hazards, are also similar demographically. Table 1 presents a demographic comparison of the two communities. Looking at these data, we can see some differences between the two. Rockaway Park, for example, is racially more diverse and has considerably more renters than Oakwood Beach. Still, there are a number of similarities. Housing in both communities consists primarily of one- or two-family homes (a large

percentage of land in both communities is open space). Both communities can be considered working class communities, with similar per-capita incomes and a large percentage of government employees. Median home values are also similar, and indicate that these are relatively affordable neighborhoods in the New York City market, especially for detached homes. Finally, both communities are fairly stable, with 83.3% of homes in Oakwood Beach and 59.5% of homes in Rockaway Park being occupied by the same persons for more than ten years.

Table 1 Demographic comparison of Oakwood Beach and Rockaway Park

	Oakwood Beach	Rockaway Park
Total population	3206	3988
White	97.9% (2673)	83.4% (3324)
Black	0.0% (22)	10% (398)
Asian	1.6% (153)	4.4% (175)
2 or more races	0.5% (15)	0.4% (14)
Hispanic origin (of any race)	6.6% (212)	9.7% (387)
Land use (2011, Staten Island/Queens)		
% 1-2 family residential	39.1	30.4
% Multi-family residential	1.5	9.1
Income and employment		
Per capita income	36,116	35,412
% of residents over age 16 employed	57.2	62.6
% Government workers	22.7	26.6
Housing		
% Homes owner-occupied	89.5	56
% Homes with same occupant(s) > 10 years	83.3	59.5
Median home value	\$443,300	594,000

Source: United States Census Bureau. All data are from 2010 unless otherwise noted. Neighborhood data reflects census data for census tracts 128.05 (Oakwood Beach) and 934.02 (Rockaway Park), which are reasonable approximations of community boundaries.

The primary research question addressed by this study, then, is: Given demographic similarities and a similar threat level for future hazards, why has one community chosen to relocate and the other chosen to stay?

Subquestions include:

1. How do perceptions of the buyout plan vary by community?
2. What is the relationship between community resilience (particularly SOC) and the relocation decision?
 - a. What markers of resilience were present in each community before Hurricane Sandy?
 - b. What were the psychosocial impacts of Hurricane Sandy?

3. What individual- and community-level factors explain one community's choice to relocate and the other community's choice to stay?

Question 1 explores perceptions of the buyout plan in each community. Questions 2 and 3 are interrelated. Question 2 examines the *unique* contribution of resilience to the relocation decision, by assessing the role of individual- and community-level variables related to resilience on the relocation decision, *exclusive* of other potential predictors. Question 3 then builds on Question 2 by assessing the role of other individual- and community-level variables that have been identified in the literature.

Methods

Data Collection

This study employs a mixed-methods approach that includes both a community survey and in-depth interviews with residents and community leaders.

Community survey. The community survey is based on the Communities Advancing Resilience Toolkit (CART; Pfefferbaum, Pfefferbaum, & Van Horn, 2011), a community intervention framework designed to enhance community resilience, specifically resilience against disasters and other crises. The version of the survey used for this study was developed by augmenting the CART survey to include questions related to Hurricane Sandy and the buyout plan. In addition, four open-ended questions were added to the end of the survey that gather information about the respondent's opinions on and eligibility for the buyout.

Community interviews. In-depth interviews with community members allow for a deeper, qualitative investigation of issues related to the buyout plan from the perspective of residents. Candidates for the community member interviews were identified during the surveying process. Community interviews consisted of open-ended questions related to the participant's view of their community, the impacts of Hurricane Sandy on the community, and their perspective on the buyout plan and its potential impact on the community.

Key informant interviews. Key informant interviews were used to explore multiple perspectives of the buyout plan from influential stakeholders at the community and policy level. Key informant interviews were conducted with community leaders in each of the target communities, and with policy makers and government representatives with in-depth knowledge of the home buyout plan.

Participants

Participants were recruited through local community leaders and at community events related to hurricane recovery and the buyout plan (convenience sampling). Additional survey participants were recruited using a systematic door-to-door sampling method in which the researcher approached homes in each neighborhood (a home in each neighborhood was randomly selected to be approached, and from there each third home was approached). Door-to-door and convenience sampling will continue through the end of August 2013 in an attempt to increase the survey sample size and to balance the gender inequality in the current sample.

A subset of survey participants were asked to participate in a community interview. Interview participants were selected based on a range of considerations, including age,

gender, and background. All interviews were administered in person. Community interviews will also continue through the end of August 2013, with the goal of completing 10 community interviews in each neighborhood.

Key informant interviews were conducted with community leaders in each community. These interviews will be supplemented by interviews with local policy representatives who have knowledge of the buyout program in New York.

Confidentiality. The names and identities of all participants are kept confidential. The purpose of the study and the rights of the participants were clearly explained to each participant both verbally and through a written consent form. All study methods were approved by the University of Hawai'i at Mānoa Committee on Human Studies to ensure the protection of participants.

Compensation. As compensation for time spent participating in this study, interview participants received a gift card in the amount of \$20.00. Survey participants were not compensated.

Data analysis

Data analysis will be conducted in the fall and winter of 2013. This section describes the plan for analysis of these data once all field work has been completed.

Qualitative data. Qualitative data collected via interviews and open-ended survey questions will be coded using a qualitative coding software, such as NVivo8. Prior to beginning the coding process, all data will be reviewed and an initial codebook developed. A process of open and axial coding (Corbin & Strauss, 2008) will be used to organize data into themes and identify lower-level (explanatory) and higher-level (thematic) concepts. Of particular interest will be themes related to perceptions of the buyout plan (Q1), markers of resilience (Q2a), the psychosocial impacts of Hurricane Sandy (Q2b), and factors that influence the relocation decision (Q3). Memos will be used to draw out and develop emerging themes, including references to the broader historical and cultural context in which the hurricane took place. As this study is specifically focused on a comparison of two communities, I will prioritize a within-case analysis (Patton, 2002) to draw out themes specific to each community.

Quantitative data. The analysis of survey data will take place in three phases. Phase 1 will be a comparison of the two communities based on descriptive statistics. These analyses will provide preliminary data related to each community's perceptions of the buyout plan, markers of resilience in each community, and the psychosocial impacts of Hurricane Sandy in each community. T-tests will be used to determine where significant differences exist between the two communities.

Phase 2 will involve the use of propensity score matching (Darnell et al., 2012; Stuart & Green, 2008; Stuart, 2010), a technique for reducing bias in non-random samples by ensuring that treatment and comparison groups are as similar as possible in terms of their background characteristics. For the purposes of this study, I will use propensity score matching to make the samples drawn from the two target communities as equitable as possible with regard to a set of covariates (age, length of residence, race, employment status, presence of children in the household).

Phase 3 will address the stated research questions using linear (Q1) and logistic (Q2, Q3) regression analyses. Factors for the regression analyses have been identified based on those included in the CART model (connection and caring, resources,

transformative potential, and disaster management). Other predictors related to community resilience and other items identified through an analysis of the literature will also be incorporated into the analyses.

Results

To date, participants in this study have included 121 survey participants (60 in Rockaway Park and 61 in Oakwood Beach), 13 community interview participants (9 in Oakwood Beach and 4 in Rockaway), and 4 key informant interview participants (2 in each neighborhood). Survey participants include 74 females (61.2%) and 47 males (38.8%). The mean age of survey respondents was 54 years, with a median age of 49. See Table 2 for a breakdown of participant characteristics by neighborhood.

Table 2 Participant characteristics by neighborhood

	Oakwood Beach	Rockaway Park
Tenure (mean in years)	17.54	26.27
Gender		
Male	29	18
Female	32	42
Age (mean)	50.5	58.36
Race		
White, non-Hispanic	55	57
Black		1
Asian	1	
Hispanic, any race	2	2
Other	3	

Preliminary t-tests on the survey data collected to date indicate some differences in resilience between the two communities that may help to explain the relocation decision. Independent samples t-tests were conducted to compare sense of community at the individual level (SOC_I), sense of community at the community level (SOC_C), sense of place (SOP), community involvement (INVOLVEMENT), community competence (COMPETENCE), and trust in public officials (TRUST) between the two study communities. On average, residents of Rockaway Park had higher levels of individual sense of community ($M=8.81$, $SE=0.19$) than residents of Oakwood Beach ($M=8.23$, $SE=0.20$). This difference was significant $t(113)=2.10$, $p<0.05$. Residents of Rockaway Park also had higher levels of sense of place ($M=11.3$, $SE=0.32$) than residents of Oakwood Beach ($M=8.04$, $SE=0.38$). This difference was significant $t(110)=6.60$, $p<.01$. With regard to the level of trust in public officials, Residents of Oakwood Beach had, on average, higher levels of trust ($M=6.56$, $SE=0.28$) than residents of Rockaway Park ($M=4.62$, $SE=0.22$). This difference was also significant $t(89)=5.23$, $p<0.01$. There were no significant differences between the two communities in SOC_C, INVOLVEMENT, or COMPETENCE.

Preliminary themes

In this section I present a series of preliminary themes that have emerged from the data to date. As data analysis is ongoing, it should be noted that these themes may be altered to account for findings based on these future analyses. In addition, results specific to the stated research questions will not be available until data collection is complete. The following points reflect themes that may help to explain the decision by members of the two study communities to rebuild or relocate in the wake of Sandy.

Salience of previous disasters. Both communities have experienced significant disasters in the past that remain salient. For Oakwood Beach, the most salient disaster was the Great Nor'easter of December 1982, which resulted in severe flooding, record high tides and sustained winds as high as 81mph in New York (National Weather Service Eastern Region, 1994). Storm surges, along with heavy rains and high wind, resulted in damage to hundreds of homes, including several feet of flooding (Paulsen, 2012). Many survey and interview participants have cited this event in describing their experience of and response to Sandy. Residents of Rockaway Park have also frequently cited past disasters, though of a different nature. The most salient events in this community were the World Trade Center attacks of September 11, 2001 (residents reported that the community lost 30 firefighters in that event) and the crash of American Airlines flight 587 in neighboring Belle Harbor on November 12, 2001. Another important influence in the experience of Sandy for residents of Rockaway Park was Hurricane Irene, which hit New York in August of 2011. A mandatory evacuation was instituted for Rockaway in preparation for Irene, though the storm did little to no damage to homes in the area. As a result, many residents reported that they did not take warning about Hurricane Sandy seriously.

Sense of place. Sense of place is a strong theme in both communities. Both Oakwood Beach and Rockaway Park are unique among neighborhoods in New York City due to their access to parks, beaches, and other natural areas. Residents of Oakwood Beach expressed a strong connection to the beach that lines their community and were actively engaged in clamming or other beach related activities. The community also organized an annual beach cleanup event. Residents of Rockaway Park also have a strong connection to the beach and, in particular, the boardwalk that lined the beach before it was destroyed by Sandy. In both neighborhoods there are families who have been living in or visiting the area for multiple generations.

At the same time, residents of both neighborhoods describe their communities as being forgotten or overlooked by New York City as a whole. Residents of both neighborhoods have reported examples of how, before Sandy, their neighborhoods did not receive the attention or resources they felt they needed. In both cases, residents' (negative) post-Sandy experiences are viewed as an extension of this relationship.

Exposure to Sandy. Both communities suffered extensive damage from Sandy, including several storm related fatalities. Still, there are several interesting differences that have emerged with regard to residents' exposure to the storm. In Oakwood Beach, flooding was the most salient effect of the storm, with flood depths of 13 to 15 feet reported by some homeowners. A secondary component of exposure for residents of Oakwood Beach was the issue of sewage overflow from the neighboring sewage treatment plant. In addition to the flood damage, residents expressed concern about lingering contamination left by the sewage plant. Flooding was also severe in Rockaway Park, though less so than in Oakwood

Beach. Fewer homes in Rockaway Park had flooding to the main floor, and the flood depth was lower (up to about 10 feet). However, several major fires broke out across the Rockaway Peninsula on the night of the storm, including two large fires that were visible to residents of Rockaway Park. Many residents who did not evacuate reported that they felt their lives were in danger from the fires. Because there was no power, residents were unable to gauge how far away the fires were from their own homes. In addition, the flooding made it impossible for firefighters to enter the area and extinguish the fires.

The context of the recovery. Residents of both communities expressed dissatisfaction related to post-disaster stressors, particularly financial stressors. Affected households have to deal with multiple insurance adjustors, FEMA, contractors, and representatives from other assistance programs. Many who had insurance (homeowners and/or flood) are dissatisfied with the amount of their claims. Misinformation and lack of communication about available programs has also been an issue in both communities. For example, homeowners have been told that they must elevate their homes or expect to pay higher flood insurance premiums after FEMA updates the flood maps for the area. However, it is not clear when these maps will be finalized, and so homeowners must make the decision of whether (and how) to rebuild without this critical information.

Homeownership as cultural identity. Both Oakwood Beach and Rockaway Park can be considered working class communities in which residents of New York City have invested heavily in the dream of homeownership. While most homes in these neighborhoods are modest, their value in the New York City housing market is high, and residents have struggled to afford and maintain their homes on middle class incomes. Related to this, a theme that is emerging from these data is that of *homeownership as cultural identity*. In this context, the loss of one's home may be best understood as an example of cultural trauma (Solomon, Greenberg, & Pyszczynski, 1991).

Application and future directions

This initial study, and future related studies, has the potential to make significant contributions to both the literature and disaster policy and practice. While some studies have explored various aspects of disaster related relocation (Najarian, Goenjian, Pelcovitz, Mandel, & Najarian, 2001; Riad & Norris, 1996; Uscher-Pines, 2009), our understanding of the individual and community level effects of such programs is limited. Furthermore, we know very little about what factors influence individual, household, and community level relocation decisions. This preliminary study expands our understanding of these important issues by exploring the influence of community resilience and other individual and community level factors on the relocation decision. By increasing our understanding of these issues we will have the research necessary to design and implement more effective rebuilding and relocation programs and be better able to support communities that face this issue in the future.

This study also lays the groundwork for future research on postdisaster relocation in the context of home buyout plans. A longitudinal study would make a valuable contribution to the disaster literature, where data on the long-term effects of disasters are relatively rare (Norris, 2006). Through this study, I am recruiting participants for a 1-year follow-up study. At that time, assuming the home buyout plan is implemented, homeowners will have made the final decision of whether to accept or reject the buyout

offer, and many homeowners will have already relocated. Research questions to be addressed by future studies might include:

- What are the long-term psychosocial consequences of home buyout programs, both for those community members who relocate and those who stay in the original community?
- What factors help or hinder the integration of relocatees into their new community?
- For communities that reject the buyout plan, what is the impact of future disasters? Do future disasters lead to a change in their stance on a buyout?

References

- Application, C., & Requirements, A. (2013). Federal Register / Vol. 78, No. 43 / Tuesday, March 5, 2013 / Notices, 78(43), 66–86.
- Associated Press. (2012, November 29). Superstorm Sandy deaths, damage, and magnitude: What we know one month later. *Huffington Post*.
- Blaze, J. T., & Shwalb, D. W. (2009). Resource loss and relocation: A follow-up study of adolescents two years after Hurricane Katrina. *Psychological Trauma: Theory, Research, Practice, and Policy*, 1(4), 312–322. doi:10.1037/a0017834
- Corbin, J. W., & Strauss, A. (2008). *Basics of qualitative research* (3rd ed., p. 379). Los Angeles, CA: Sage Publications.
- Darnell, A. J., Barile, J. P., Weaver, S. R., Harper, C. R., Kuperminc, G. P., & Emshoff, J. G. (2012). Testing Effects of Community Collaboration on Rates of Low Infant Birthweight at the County Level. *American Journal of Community Psychology*, 51, 398–406. doi:10.1007/s10464-012-9559-x
- De Vries, D. H., & Fraser, J. C. (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.
- Dolnick, S. (2011, August 28). Damage From Irene Largely Spares New York. *The New York Times*. Retrieved from <http://www.nytimes.com/2011/08/29/nyregion/wind-and-rain-from-hurricane-irene-lash-new-york.html?pagewanted=all>
- Flegenheimer, M. (2011, September 8). Northeast is soaked again, forcing evacuations. *The New York Times*. Retrieved from <http://www.nytimes.com/2011/09/09/nyregion/remnants-of-tropical-storm-soak-an-already-battered-northeast.html>
- Fraser, J. C., Doyle, M. W., & Young, H. (2006). Creating Effective Flood Mitigation Policies. *Eos*, 87(27), 265–270.
- Hori, M., & Schafer, M. J. (2009). Social costs of displacement in Louisiana after Hurricanes Katrina and Rita. *Population and Environment*, 31(1-3), 64–86. doi:10.1007/s11111-009-0094-0
- Hunter, L. M. (2005). Migration and Environmental Hazards. *Population and environment*, 26(4), 273–302. doi:10.1007/s11111-005-3343-x
- Kaplan, T. (2013, February 3). Cuomo seeking home buyouts in flood zones. *New York Times*.
- Knafo, S. (2013, February 4). Sandy-shaken Staten Island applauds Cuomo's proposal to buy out destroyed homes. *Huffington Post*.
- Knobloch, D. M. (2009). Moving a Community in the Aftermath of the Great 1993 Midwest Flood. *Journal of Contemporary Water Research & Education*, 130(1), 41–45. doi:10.1111/j.1936-704X.2005.mp130001008.x
- Najarian, L. M., Goenjian, A. K., Pelcovitz, D., Mandel, F., & Najarian, B. (2001). The effect of relocation after a natural disaster. *Journal of Traumatic Stress*, 14(3), 511–526.
- New York City Office of Emergency Management. (2009). *The City of New York Natural Hazard Mitigation Plan* (p. 179). New York. Retrieved from http://www.nyc.gov/html/oem/html/about/planning_hazard_mitigation.shtml
- New York State Homes and Community Renewal. (2013). *State of New York action plan for Community Development Block Grant program disaster recovery* (p. 61). Retrieved from <http://www.nyshcr.org/Publications/CDBGActionPlan.pdf>

- Norris, F. H. (2006). Disaster research methods : Past progress and future directions. *Journal of Traumatic Stress, 19*(2), 173–184. doi:10.1002/jts.
- Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed., p. 688). Thousand Oaks, CA: Sage Publications.
- Pfefferbaum, R. L., Pfefferbaum, B., & Van Horn, R. L. (2011). *Communities Advancing Resilience Toolkit (CART): The CART Integrated System* (p. 79). Oklahoma City, OK: Terrorism and Disaster Center at the University of Oklahoma Health Sciences Center.
- Riad, J. K., & Norris, F. H. (1996). The influence of relocation on the environmental, social, and psychological stress experienced by disaster victims. *Environment and Behavior, 28*(2), 163–182.
- Roy, Y. (2013, February 4). Pols: Few on LI want to move under Cuomo buyout plan. *Newsday*. Retrieved from <http://www.newsday.com/classifieds/real-estate/pols-few-on-li-want-to-move-under-cuomo-buyout-plan-1.4562781>
- Russ, H. (2012, November 27). New York, New Jersey put \$71B price tag on Sandy. *MSN News*.
- Sanders, S., Bowie, S. L., & Bowie, Y. D. (2003). Chapter 2 lessons learned on forced relocation of older adults. *Journal of Gerontological Social Work, 40*(4), 23–35.
- Scannell, L., & Gifford, R. (2011). Personally relevant climate change: The role of place attachment and local versus global message framing in engagement. *Environment and Behavior, 45*(1), 60–85. doi:10.1177/0013916511421196
- Solomon, S., Greenberg, J., & Pyszczynski, T. (1991). A terror management theory of social behavior: The psychological functions of self-esteem and cultural worldviews. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (pp. 91–159). San Diego: Academic Press.
- State of New York. (2013). Recreate NY Smart Home Program. Retrieved from http://nysandyhelp.ny.gov/sites/all/themes/ny_sandy_help/documents/smarthome-factsheet.pdf
- Stuart, E. A. (2010). Matching methods for causal inference: A review and a look forward. *Statistical Science, 25*(1), 1–21. doi:10.1214/09-STS313.Matching
- Stuart, E. A., & Green, K. M. (2008). Using full matching to estimate causal effects in nonexperimental studies: Examining the relationship between adolescent marijuana use and adult outcomes. *Developmental Psychology, 44*(2), 395–406. doi:10.1037/0012-1649.44.2.395
- Sullivan, B. (2013, April 26). Secretary Donovan and Governor Cuomo announce approval of New York State's disaster recovery plan. *U.S. Department of Housing and Urban Development*. Retrieved May 04, 2013, from http://portal.hud.gov/hudportal/HUD?src=/press/press_releases_media_advisories/2013/HUDNo.13-056
- Uscher-Pines, L. (2009). Health effects of relocation following disaster: A systematic review of the literature. *Disasters, 33*(1), 1–22. doi:10.1111/j.0361-3666.2008.01059.x
- Yzermans, C. J., Donker, G. a, Kerssens, J. J., Dirkzwager, A. J. E., Soeteman, R. J. H., & ten Veen, P. M. H. (2005). Health problems of victims before and after disaster: a longitudinal study in general practice. *International journal of epidemiology, 34*(4), 820–6. doi:10.1093/ije/dyi096