THE UNIVERSITY OF NORTH CAROLINA

AT

CHAPEL HILL

MITIGATING REPETITIVE LOSS PROPERTIES

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TABLE OF CONTENTS

TABLE OF TABLES

TABLE OF FIGURES

EXECUTIVE SUMMARY

Of all natural hazards in the United States, flooding has historically caused the greatest damage and loss of life. U.S. policy toward reducing flood losses has evolved from purely structural control measures to the development of building regulations and the implementation of the National Flood Insurance Program (NFIP) in 1968. Since the 1990's, mitigation has taken a more prominent role as a mechanism to move people out of harm's way. Repetitively flooded properties are a special concern to the federal government as these properties place a sizable financial burden on the NFIP. These repetitive loss properties, defined as properties that have had two or more flood insurance claims of $1,000 or more in any rolling ten-year period, have cost the NFIP program $4.6 billion since 1978. Congress recently passed legislation intended to encourage property owners of so-called "severe" repetitive loss properties to take action to decrease flood losses. The legislation includes a pilot program whereby property owners will be given an opportunity to participate in mitigation activities such as acquisition, relocation, or elevation, among other options. Should homeowners decline the offer of mitigation, their insurance premiums may be adjusted to actuarial rates, thereby strengthening the financial stability of the flood insurance program.

The success of mitigation programs depends upon the voluntary participation of homeowners. In order to better understand the factors that influence homeowner decision-making, the Federal Emergency Management Agency (FEMA) solicited this study of mitigation offers to repetitive loss property owners. This study utilizes a two-fold approach to examine homeowner decision-making. First, this report presents key factors impacting property owners as reported by homeowners themselves. A random sample of 237 repetitive loss property owners was surveyed. Second, the results of interviews with mitigation officials at the state and local level are presented as a framework for understanding the program structure. The surveys and interviews were conducted at eight different study sites across the U.S. and together provide comprehensive insight into mitigation programs from diverse viewpoints.

Factors Influencing Property Owner Decision-Making

Homeowner surveys were analyzed by statistical regression methods and indicate four key concepts that influence property owner decisions to accept or decline mitigation offers.

- First, the availability of ***matching funds*** was the strongest factor in the regression model. Federal mitigation grant programs require that 25 percent of the cost of mitigation be provided by non-federal sources. In cases where the individual property owner had to provide these matching funds, participation in the mitigation programs was dramatically reduced. Homeowners were six and a half times more likely to accept an offer of mitigation when matching funds were provided to them.

- Second, the ***helpfulness*** of mitigation officials as perceived by property owners, was a key factor in the model. Mitigation officials guided homeowners through the mitigation process and served as the interface between state and federal agencies and individual participants. Homeowners were five times more likely to accept offers of mitigation when the mitigation official was deemed helpful.

- Third, s***ense of place*** influenced homeowner decision-making. Sense of place encompasses measurements of the property owner's identification with a particular property and neighborhood. Two factors were included in the statistical model to assess sense of place. Firstly, property owner self-appraisal of **property condition** measured the degree to which homeowner's valued their property. Secondly, the **neighborhood attachment** factor measured the property owner's concern over leaving the neighborhood and identification with the broader place. Higher levels of self-reported property condition and neighborhood attachment resulted in a decreased likelihood of accepting the mitigation offer. As property condition increased, likelihood of participation decreased by 50 percent. Likewise, as neighborhood attachment increased, likelihood of participation decreased by 30 percent.

- Fourth, ***demographic*** variables were also significant factors influencing homeowner decision-making. Variables such as **income** level and **number of children** living in the home were examined in the model. Compared with high-income households, medium-income households were less likely to accept an offer of mitigation. Households with children less likely to accept an offer of mitigation.

Priority Areas for Improving Program Outcomes

Interviews with state and local mitigation officials reveal particular elements of mitigation programs that are critical for encouraging homeowner acceptance of offers. The striking similarity between the homeowner survey results and the interviews with mitigation officials highlights key areas for strengthening programs. The three recommended steps listed below were developed from the interviews and support key factors found in the homeowner model.

The **first step** in increasing participation is to finance the 25 percent match initiative and to increase funding for programs. Officials noted that insufficient funds crippled programs and thwarted homeowner participation. In certain cases, the shortage of funds prevented the implementation of the more robust mitigation activities. In other cases, homeowners did not have sufficient resources to provide the 25 percent match and did not participate.

The **second step** is to increase the ability of mitigation officials to help property owners. FEMA can foster trusting relationships between mitigation officials and neighborhoods by supporting alliances with community-based organizations. Additionally, the structure of the grant programs should be modified to support the ability of mitigation officials to be helpful. Such strategies would provide cities, counties and states with incentives to build local capacity and replace the current program structure that preferentially supports reliance on non-local, private sector organizations. An increased emphasis on streamlining project applications and investing greater decision-making power in local agencies would also support the relationship between homeowners and local mitigation.

The **third step** is to implement strategies that consider the impact of sense of place on homeowner participation. Through understanding the individual and group decision-making process, mitigation officials can tailor their approach and address these intangible barriers to participation. Special circumstances such as the physical geography and economic markets of a region must also be addressed to increase homeowner participation.

Policy Recommendations for Mitigation Programs

Based upon the data analysis and findings, the following policy suggestions are provided to FEMA for consideration:

Site Match

- Create mechanisms to dedicate funding streams for mitigation that permit flexible or no-cost sharing, and thus alleviate the 25 percent match requirement burden on the homeowner.

Helpfulness

- Inquire into exactly how localities are building neighborhood-based linkages, and how these may support mitigation goals. Ideally, this information should be compiled and disseminated across the country.

- Create sustainable local mitigation programs with strategies that provide cities, counties and states with support and incentives to build local capacity, as opposed to relying on non-local, private sector organizations.

- Reduce project-approval delays through streamlining the application process. Further research is required to gather a national dataset for the purposes of systematically examining a wide range of local contexts and modeling site variables. This model could be used to develop a range of mitigation opportunities for different types of places.

- Develop trans-local (horizontal) learning opportunities for localities, including documentation of effective practices and dissemination of information.

- Provide mechanisms to increase the exchange of experiential learning and knowledge between different levels of government (strengthening vertical ties).

Sense of Place

- Create flexibility for localities to develop mitigation projects that intersect with other land-use goals (neighborhood level mitigation projects), and the ability to modify projects as necessary.

- Develop ways to work with localities that have special circumstances (including strong housing markets and land-use regulations, among others) that hinder implementing mitigation activities.

INTRODUCTION

Flooding causes the greatest economic losses and greatest loss of life of all natural hazards within the United States (Mileti 1999). In fact, 90 percent of natural disasters in the U.S. include flood events (U.S. General Accounting Office (GAO) 2005). For the ten-year period from 1992 to 2001, 900 deaths and damages totaling $55 billion were reported as a result of flooding. More recent figures indicate that flooding causes $1 billion in property damage annually within the U.S. (GAO 2004).

U.S. policy toward reducing flood losses has evolved through three broad phases. The first phase (1917-1965) focused on structural flood control measures. The second phase (1966-1992) focused on building regulations and insurance, in addition to flood control. In the third phase, (1993-present) federal policies have focused on mitigating the impacts of floods by moving existing structures out of harm's way and avoiding future development in flood-prone areas. While the federal government has increasingly taken responsibility to assist those who are impacted by flooding, there is currently concern over how to promote responsible decision-making on the part of property owners whose property have been repeatedly flooded (Platt 1999). Since the 1990s, reports to the Federal Emergency Management Agency (FEMA) have focused on strategies for sharing the challenge of repetitive flooding with more proximate government agencies and property owners themselves (Interagency Floodplain Management Review Committee 1994; National Academy of Public Administration 1993; National Performance Review 1993).

While one percent of the properties in the National Flood Insurance Program (NFIP) are classified as repetitive loss properties, they account for 30 percent of all NFIP claims. Repetitive loss property owners have made annual claims exceeding $80 million in some years (FEMA 2003). In total, the NFIP has paid $4.6 billion for repetitive loss claims since 1978 (GAO 2004). Recently, the U.S. Congress passed the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (FIRA) to reduce this economic burden that severe repetitive loss properties impose upon the NFIP program. This legislation will maintain the fiscal soundness of the NFIP program first through offering financial assistance for the voluntary mitigation of targeted properties and second, by raising insurance premiums to actuarial rates for properties refusing mitigation.

Embedded within this legislative policy context is the need to examine the reasons why repetitive loss property owners accept or decline offers for flood mitigation. Most of what is

known about mitigation decision-making is based on conjecture rather than systematic research (FEMA 2003). This paper begins to address this gap by presenting findings from a national study on offers for mitigation conducted at eight sites across the United States. Mitigation offers examined in this paper include both buyouts, which involve the transference of property from the individual to the state and subsequent relocation of the homeowner, and elevation of homes. In order to better understand decision-making at the property owner level, we conducted 237 phone surveys of property owners who were offered financial mitigation assistance through various federal grant programs. To understand the policy context within which homeowners made their decisions, we interviewed 41 mitigation officials from the local, state, and federal governments during site visits.

This mixed-method approach provided both quantitative data and qualitative data regarding homeowner decision-making. Quantitative data from the surveys was used in a logistic regression model to examine the factors that increased the likelihood of property owners accepting an offer of mitigation. Qualitative data from interviews with the mitigation officials was coded and analyzed for information regarding current process-related challenges to mitigation. Together, these data permitted a detailed examination of household decision-making within the context of the federal flood mitigation programs.

A. U.S. Policies and Practice Related to Flood Control

For most of the twentieth century, U.S. flood control policy has focused primarily on taming rivers with structures such as dams, floodwalls and levees. While this structural approach undoubtedly reduced the severity of flooding in many communities, it also destroyed the natural capacity of floodplains to attenuate floods. Structural projects lulled communities into a false sense of security where it was assumed that previously flood-prone areas were safe for development (White 1945; Burby et al. 1991; Burby et al. 1988). In addition, these structural flood controls were enormously expensive. Despite billions spent on such projects, flood losses continue to occur, as more people and property become exposed to flooding (Godschalk et al. 1999).

Since 1968, with the creation of the National Flood Insurance Program (NFIP), U.S. national policy began to shift, albeit slowly, toward nonstructural measures such as land-use controls and building standards. Floodplain land-use regulations, as required for communities participating in

the NFIP, are aimed primarily at reducing the susceptibility of new development to flooding, rather than solving problems due to past floodplain development (Burby et al. 1988). Though NFIP permits construction in flood-prone areas, the program requires new development in such areas to comply with local floodplain ordinances that meet minimum federal standards. The NFIP, however, does not require communities to adopt land-use controls that steer development to areas outside of the floodplain. As a result, floodplain regulations generally have been ineffective in reducing flood losses for existing development (Kusler 1973; Burby et al. 1991). Critics have argued that federal flood control efforts along with the availability of relatively cheap federal flood insurance have facilitated development in floodplains, putting more people and buildings at risk and perpetuating a cycle of repetitive damage and development.

B. FEMA Mitigation Grant Programs

In the early 1990s, U.S. national policy entered the "mitigation era" (Godschalk et al. 1999) as FEMA shifted away from structural measures toward programs that move people out of harm's way. The creation in November 1993 of the Mitigation Directorate by FEMA represented a fundamental change in disaster and emergency management. For the first time in the history of federal disaster assistance, mitigation became a cornerstone of emergency management (FEMA 1995).

Over the subsequent years, the Federal government created three grant programs supporting mitigation. The Flood Mitigation Assistance Program (FMA) created in 1994 provides $20 million annually for planning, projects and technical assistance for flood-related projects. The goal of this program is to reduce the losses to NFIP insured properties. Grants are managed by states and applications are prioritized based on a cost-benefit review and targeted repetitive loss properties. The federal government funds 75 percent of project costs and requires the remaining 25 percent to be financed by a non-federal match.

The Pre-Disaster Mitigation Program (PDM), on the other hand, provides funds for all hazard mitigation projects, not only flood hazards. PDM grants are nationally competitive and also require a non-federal cost share of 25 percent. The grants may be awarded to states and local communities as long as applicants follow a FEMA-approved hazard mitigation plan. Although the Disaster Mitigation Act of 2000 created the program five years ago, its implementation was delayed and it is currently in the third funding cycle.

The third program, the Hazard Mitigation Grant Program (HMGP), is FEMA's flagship mitigation program, and like the PDM addresses mitigation of all natural hazards. HMGP funds are typically provided after disasters, with the available amount determined by a formula established by Congress. As with all three grants, project applications require a 25 percent match of non-Federal funds. Grants can be used for a variety of activities, including acquiring, elevating or relocating homes. All three FEMA mitigation programs are voluntary, meaning that neither FEMA nor any other government entity can force homeowners or communities to participate.

C. The National Flood Insurance Reform Act (The Bunning-Bereuter-Blumenauer Act)

The Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (FIRA) created a pilot program authorizing up to $40 million annually to mitigate severe repetitive loss properties in an effort to make the NFIP more financially sound.[1] The funds will be allocated to the states in proportion to the percentage of severe repetitive loss properties within the state.[2] The U.S. Congress intends that FIRA will ease the $200 million annual burden that repetitive loss properties place on the NFIP. While repetitive loss properties are roughly one percent of NFIP properties, they compose 25 to 30 percent of claim losses. Therefore, this relatively small group of properties presents a unique opportunity for reducing the program's financial losses. While there are 4.4 million NFIP policyholders nationwide, there are approximately 48,000 repetitive loss properties based on a broad definition for repetitive loss.[3] A subset of these properties, roughly 10,000 in total, fall into a more stringent definition of target repetitive loss.[4]

In order to encourage local responsibility for flood prevention, the legislation provides funds to local governments through the states to complete activities including buyout, elevation, relocation, and flood-proofing of repetitive loss properties. Property owners who refuse offers of mitigation will have to pay increased insurance rates. Currently many property owners pay

[1] P.L. 108-264, 118 Stat. 712. The act also authorizes an additional $20 million for the flood mitigation program and $10 million for mitigation in communities lacking the resources to run their own mitigation programs. Severe repetitive loss as defined in FIRA for single-family residences are those properties with four or more payments greater than $5,000 each and together exceeding $20,000 or having two or more claims together exceeding the property value.

[2] Ibid., sec. 1361A(f)(5)(A).

[3] The broader definition accounts for properties with two or more flood losses greater than $1,000 within a 10-year period.

[4] The more stringent definition states repetitive losses properties as those with two or three losses together exceeding building value or four or more losses each greater than $1,000.

subsidized insurance rates (pre-FIRM rates) well below actuarial or market rates. It is anticipated that homeowners will accept the offer to secure their homes or relocate out of harm's way, especially with the added disincentive of increased insurance premiums.

METHODOLOGICAL APPROACH

Two complimentary research methods were utilized in this study to examine the factors that are associated with the property owner's decision to accept or decline an offer of mitigation. First, we interviewed state and municipal mitigation officials during site visits. These interviews provided an understanding of the local mitigation context and the manner in which individual property owners participated in programs. This qualitative data was coded and analyzed, providing a framework for the subsequent household findings. Second, we administered surveys to property owners to understand the various factors that influenced their decision-making. This quantitative data was used in a logistic regression to model factors associated with accepting or declining offers of mitigation.

The perspectives of different governmental actors and the opinions of property owners were collected by a four-step process and subsequently examined for factors influencing individual participation in mitigation programs. First, preliminary interviews were conducted with FEMA mitigation staff and related employees responsible for the NFIP program to gather background information. Second, telephone interviews with FEMA regional divisions as well as state and municipal mitigation officials were completed. Third, the qualitative data were collected in interviews during site visits with state and municipal officials. Information gathered during the interviews was used to build a sampling frame from which repetitive loss property owners were randomly chosen to participate in a telephone survey. Fourth, the quantitative data were collected through telephone interviews with a sample of repetitive loss property owners.

A. Site Selection

Eight sites were selected for the study based upon a range of theoretical and practical criteria including NFIP history, mitigation outreach record, type of mitigation, socio-demographic characteristics of the repetitive loss population, and geographic diversity (see Figure 1). Public domain data provided by FEMA was used to categorize sites. The site selection process entailed a visual inspection of the targeted repetitive loss structure map provided by FEMA (see Figure 2

in Appendix A), interviews with 18 mitigation and insurance specialists at FEMA in Washington, D.C., evaluation of a data set of the top 101 target sites provided by FEMA, evaluation of the Bureau of Statistical Agency's NFIP repetitive loss data, and evaluation of selected sites based on Census 2000 data as well as FEMA Community Rating System data measuring site mitigation performance.

The selected sites included: the Town of Felton, California; Sacramento County, California; Jefferson Parish, Louisiana; St. Tammany Parish, Louisiana; the City of Savannah, Georgia; City of Washington, North Carolina; Beaufort County, North Carolina; and the Town of Belhaven, North Carolina (see Figure 3 and Table 4 in Appendix B).

Figure 1. Site Selection Criteria.

1. NFIP insurance history
Sites were selected if they had a significant number of target repetitive loss properties relative to all repetitive loss properties, a high amount of total paid insurance claims per NFIP policy- holder, and a large number of insured repetitive loss properties relative to the total number of repetitive loss properties.

2. Mitigation outreach record
The sample included communities that have both successful and challenged track records of promoting mitigation and outreach. This track record was based on the scoring of the Community Rating System (CRS).

3. Type of mitigation
The sample included sites performing elevation and buyouts, as well as structural approaches such as storm water management projects, in their general strategies for mitigation.

4. Repetitive loss socio-demographic diversity
Sites represented the socio-demographic diversity present in the U.S. population, including wealth and ethnicity.

5. Geographic diversity
Sites were located in areas that have unique biophysical properties and at a minimum included both riverine and coastal flooding. The sites represented a diversity of locations and were spread representatively across major repetitive loss areas in the United States.

B. Sample

After choosing the eight sites, mitigation officials at the state level (California, Louisiana, Georgia, and North Carolina) and city/county levels were interviewed. These interviews were

conducted during site visits to obtain mitigation officials' perspectives on repetitive loss mitigation efforts and to collect the most current lists of repetitive loss property owners within their jurisdiction who had received a mitigation offer. This proved to be significant, as local mitigation officials had the most current repetitive loss property owner data. In total, there were 668 repetitive loss properties to which mitigation offers had been made at the eight sites studied. From this list, a sample of 300 households was randomly selected. A total of 237 households completed surveys yielding a 79 percent return rate. Of the households surveyed, there were 190 repetitive loss households that accepted the mitigation offer and 47 repetitive loss households that refused the offer. The remaining 63 non-participating households were either unable to be contacted or, in a few cases, were unwilling to participate.

C. Research Tools

1. Household Survey

While there have not been any examinations of why repetitive loss property owners choose to accept or decline an offer of mitigation, a small handful of studies have been conducted on property owners who have experienced severe and catastrophic flooding (Fraser 2004; Handmer 1986). These studies find that three sets of factors effect the decision-making process: **Sense of Place** – with greater identification and attachment to one's neighborhood the decision to mitigate becomes more difficult and property owners are less likely to mitigate; **Process/Program** – with an increase in helpfulness on the part of the mitigation official there it is easier to make a decision about mitigation and a greater likelihood of accepting an offer of mitigation; **Risk Perception** – with an increase in the concern about potential future flooding there was an increase in property owners accepting an offer of mitigation.

The household survey for our study contained measures for all three of these factors. Prior studies have not found significant relationships between demographic variables such as income and family composition (i.e., for example the number of children and elderly) and property owner mitigation decision-making, but interviews with FEMA staff indicated that both of these factors were anecdotally reported as potentially significant predictors of property owner decision-making. Therefore, **Demographic Variables** for income and family composition were included.

The dependent variable in the current study was **Mitigation Decision** – accepting or declining an offer of mitigation. In addition, interviews with FEMA staff indicated that property condition at the time a mitigation offer was made, might be an important variable since people might be less likely to leave or physically alter a structure they felt was in good condition. We included this item under sense of place. One other factor that we included was site match – the state or locality providing the property owner the 25 percent non-federal funds required to match the 75 percent federal contribution to the mitigation offer. This match was an important variable in a prior study and was one of the reasons that the State of North Carolina was so successful in mitigating properties after Hurricane Floyd (Fraser 2004). Altogether, the household telephone survey was composed of 30 questions and lasted approximately 20-30 minutes.

2. Interview Guide

The field interview guide used in conversations with mitigation and insurance officials at the federal, regional, state, and city/county levels was composed of four sections. These included questions regarding the knowledge and history of the repetitive loss issue in the locality, the process of making a mitigation offer, the perceived reasons for the success of an offer, and the organizational dynamics between different entities that are involved in mitigation work. These interviews were used to broadly examine the perspectives of officials working to mitigate repetitive loss properties and to frame the survey responses from property owners within the local context. All interviews were conducted face to face at FEMA offices or at the sites that were chosen for the study. Each of the FEMA interviews lasted between 45 and 90 minutes, and site interviews with state and city/county mitigation officials were conducted during multi-day long visits and lasted between two and five hours.

HOUSEHOLD SURVEYS: ANALYSIS AND FINDINGS

A. Approach to Analysis

The goal of the household survey was to collect data on factors related to repetitive loss property owner decisions to accept or reject an offer of mitigation. After preliminary diagnostics were run on all of the variables to examine their distributions, bivariate correlations and logistic regression analysis were employed for the entire sample. The purpose of the bivariate correlations was to examine the relationship between each independent variable with the

dependent variable, and to determine if any of the independent variables were highly correlated. Logistic regression analysis was conducted to further examine these relationships, and permitted us to calculate the odds of property owners accepting or rejecting an offer of mitigation. This was expressed as an increase or decrease in the likelihood of accepting an offer of mitigation. In the following tables and discussion we report on variables that were statistically significant in their association to the dependent variable, Mitigation Decision. We note that Risk Perception was not one of these variables, so it is left out of further discussion. This does not mean that Risk Perception is insignificant, but it does suggest that repetitive loss property owners may be responding to the fact that repetitive flooding is not necessarily of a catastrophic nature, but rather a nuisance.

Table 1. Percentages for Variables in the Model.

Variables	Range of Responses	Percentage
Sense of Place		
1. Property Condition	1=poor, 2=fair, 3=good, 4=excellent	2.79 (mean)
2. Neighborhood Attachment	0=not concerned, 1=concerned	.45
Process/ Program		
3. Helpfulness	0= not at all helpful/not very helpful 1= somewhat helpful/very helpful	.72
4. Site Match	0= no site match, 1= site match	.54
Demographic		
5a. Low Income	Under $10,000 - $19,999	.19
5b. Medium Income	$20,000 - $59,999	.54
5c. High Income	$60,000 and higher	.26
6. Children	0= no children in household 1= children in the household	.40
Dependent Variable		
7. Mitigation Decision	0= declined, 1=accepted	.80

Table 1 provides a descriptive statistics for selected independent variables that were significantly correlated with the dependent variable, the mitigation decision. **Sense of Place** included two variables. The first variable, Property Condition, with a mean of 2.79, indicates that on average, respondents rated their property between fair and good, but had a standard deviation of .87, which indicates that there was a significant amount of dispersion around the mean. The second variable, Neighborhood Attachment, was originally a four-point response item but was collapsed to its bi-modal distribution. Forty-five percent of the respondents reported that they were concerned about leaving their neighborhoods. **Helpfulness** was measured by one variable. Seventy-two percent of respondents reported that the mitigation official assisting them was somewhat/very helpful. **Site Match** was also measured by one variable. Fifty-four percent of the respondents were offered the 25 percent match that was required to participate in mitigation. **Demographic factors** were measured by two variables, including income and children. The income variable was split into three categories low, medium and high. Nineteen percent of the respondents reported being in the Low Income category, 54 percent in the Medium Income category and 26 percent in the High Income category. Forty percent of the respondents reported having at least one child. The dependent variable, **Mitigation Decision**, consists of one variable. Approximately 80 percent of the sample accepted an offer of mitigation (n= 190) and 20 percent declined (n= 47).

B. Factors that Shape Mitigation Decision-Making: Bivariate Findings

Table 3 (see Appendix A) shows selected bivariate correlations between the independent and dependent variables. The coefficient ranges between -1 and 1. The closer the coefficient is to either -1 or 1, the stronger the relationship between the two variables. The asterisks mean that the relationship is statistically significant as opposed to being a random association. A statistically significant coefficient between two variables indicates a relationship that needs to be noted. Of particular interest are relationships between the independent variables and the dependent variables.

For example, **Mitigation Decision** is negatively correlated with **Sense of Place** variables, (1) Property Condition (-.235**) and (2) Neighborhood Attachment (-.202**). This means that accepting an offer of mitigation is moderately, negatively correlated with an increase in Sense of Place. Alternatively, **Mitigation Decision** is positively correlated with **Process/Program**

variables, (3) Helpfulness (.254**) and (4) Site Match (.374**). This means that accepting an offer of mitigation is moderately correlated with Process/Program. **Mitigation Decision** is weakly correlated with the **Demographic** variable (5a) Low Income (.164*) and not correlated with (5b) Medium Income, (5c) High Income, or (6) Children. This means that accepting an offer of mitigation is positively correlated the Low Income demographic group.

These findings begin to tell a story of why people might choose to accept or decline an offer of mitigation, albeit a partial story. When all of the independent variables are examined together for their influence on the dependent variable, some relationships change. Based upon the bivariate correlations there is support for the importance of understanding the ways that Sense of Place (those who rate their property well and are concerned about leaving their neighborhood) needs to be taken into consideration when making an offer of mitigation to a repetitive loss property owner. Prior work has suggested that when an offer of mitigation is made well after a flood event, then the property owner is more likely to have invested in repairing their home (Fraser 2004), and interviews with local mitigation officials that are analyzed the next section of the findings corroborate that many times property owners invest resources in their homes that they will unlikely recoup through accepting an offer of mitigation. Likewise, neighborhood attachment may be a multi-dimensional variable that refers to many different ways of being connected to a place. This may refer to connections and community that property owners experience as part of living in their current neighborhood, or, as our analysis of local mitigation officials in the next section suggest, opportunities to find housing in the vicinity may be a barrier to accepting an offer of mitigation.

An important part of the mitigation story seems to revolve around Process/Program features, both having a positive mitigation offer experience and being able to obtain resources to offset costs that the property owner would have to absorb due to the 25 percent match required by FEMA mitigation programs. The finding that having a positive experience with a mitigation official is a significant predictor of property owner willingness to accept an offer of mitigation corroborates past research (Fraser 2004). In the next section of the findings we present the perspective of local officials as they report on structural features of FEMA mitigation programs and how these shape their ability to be helpful to repetitive loss property owners. We suggest that there exists a scale of helpfulness that goes well beyond the individual property owner and the local mitigation official and includes the program structure as well as mitigation officials at

regional and federal levels. In summary, Sense of Place and Process/Program variables are all significant factors that need to be considered when making an offer of mitigation. The demographic variables play a less influential role.

C. Factors that Shape Mitigation Decision-Making: Multivariate Findings

The multivariate findings support and extend the bivariate findings. As described above, Sense of Place, Process/Program, and Demographics were all associated with the Mitigation Decision. In the bivariate analysis we ascertained what factors were significantly related to repetitive loss property owner decision-making as it relates to accepting or declining an offer of mitigation. That level of analysis examined each independent factor's relationship to the dependent variable (Mitigation Decision) without accounting for the interplay that between independent variables when they are all analyzed in the same equation. A multivariate statistical technique is employed to do this simultaneous modeling. Since the dependent variable (Mitigation Decision) has only two possible outcomes, accept or decline, we can use an analytical technique (logistic regression) that will provide an intuitive odds-ratio statistic, the Exp(β). This statistic can be used to make statements about the relationships between the independent and dependent variables in the model. We note that High Income was not entered into the multivariate model because it served as a comparative for Low Income and Medium Income, that is, one would interpret the results of the latter variables in relation to the control group (High Income).

Interpreting the Exp(β) statistic is relatively straightforward as it can be interpreted as the odds of the dependent variable, accepting an offer of mitigation, occurring. Exp(β) values above one suggest a greater likelihood of accepting mitigation as the independent variable increases. When the Exp(β) for the independent variable is less than one, the likelihood of accepting a mitigation offers decreases. For example, both variables under **Sense of Place** – (1) Property Condition and (2) Neighborhood Attachment—have Exp(β) statistics less than 1 (.49 and .29, respectively). With a one-unit increase in Property Condition the odds of accepting an offer are .49 (a decrease). Similarly, with a one-unit increase in Neighborhood Attachment the odds of accepting an offer are .29 (a decrease). Therefore, with an increased Sense of Place there is a decrease in the likelihood that a repetitive loss property owner will accept an offer of mitigation. This is consistent with the bivariate findings, and provides more support to the perspective that

mitigation efforts are shaped by the ability of officials to work with repetitive loss property owners from the vantage point of valuing place-specific concerns and commitments. This is examined further in the next section in the analysis of interviews with local mitigation officials.

The Process/Program variables that were shown to be associated with mitigation decision-making in the bivariate analysis also maintain their significance in the multivariate model. With a one-unit increase in **Process/Program** variables – (3) Helpfulness and (4) Site Match—the odds of accepting an offer of mitigation increase substantially. In fact, these are the two strongest variables. With a one-unit increase in Helpfulness there is a 5.27 (527 percent) increase in the likelihood that an offer of mitigation will be accepted. Likewise, with a one-unit increase in Site Match there is a 6.43 (643 percent) increase in the likelihood that an offer of mitigation will be accepted. When repetitive loss property owners in the sample reported that the mitigation official was helpful in addition to the provision of a site match, the likelihood of accepting a mitigation offer increases dramatically. This cannot be overstated, as many of the mitigation official's note in the next section; both of these factors are shaped at the state, regional and federal levels as well as at the local level.

The **Demographic** variables performed well in the multivariate model as well. With a one-unit increase in two Demographics – (5b.) Medium Income and (6) Children—the odds of accepting an offer of mitigation were .46 and .46, respectively (a decrease in both cases). The robustness of the relationships is not entirely clear, as the significance threshold had to be relaxed for both variables, but this was deemed appropriate due to the relatively small sample size of respondents who declined an offer of mitigation. These finding that Medium Income respondents were less likely to accept an offer of mitigation than High Income, but that Low Income was not significant, is provocative. It lends support to the interpretation that Medium Income repetitive loss property owners face obstacles to participation that are not encountered by Low Income and High Income property owners. This does not discount the very real obstacle that poverty may have on households that are Low income, but it does suggest that possibly Medium Income property owners fall in a gap. We ran an additional analysis to test the effect of being Medium Income and also being in a locale that provide the Site Match. In this analysis Medium Income repetitive loss property owners were over 4 times (400 percent) more likely than High Income repetitive loss property owners to accept an offer of mitigation. The implication of this finding is that Medium Income repetitive loss property owners may very well

be structurally impeded from participating in mitigation. These demographic findings also suggest that having children somehow decreases likelihood of accepting mitigation. More research needs to be done to ascertain why this was the case.

Table 2. Logistic Regression Model for Rejecting/Accepting an Offer of Mitigation.

Variables	β	SE	Wald	p Value	Exp(β)
Sense of Place					
1. Property Condition	-.71	.27	6.81	.000	.49
2. Neighborhood Attachment	-1.23	.43	7.19	.007	.29
Process/ Program					
3. Helpfulness	1.66	.45	13.63	.000	5.27
4. Site Match	1.86	.46	16.27	.000	6.43
Demographic					
5. Household Income					
a. Low Income	.58	.83	.490	.484	1.79
b. Medium Income	-.77	.46	2.77	.096	.46
6. Children	-.76	.40	3.50	.062	.47
Model χ 2 = 73.157, *df* = 7, *p*= .000					

MITIGATION OFFICIAL INTERVIEWS: ANALYSIS AND FINDINGS

Common themes emerged from the interviews with state and local officials. These concepts support the findings from the homeowner surveys and are presented by similar concept groupings. These interviews provided a more extensive opportunity to assess programmatic elements of the mitigation grant programs that support property owner decisions to participate.

A. Sense of Place: How Home and Neighborhood Shape Mitigation Decision-Making

Inspection of these variables suggests some noteworthy patterns operating for those who accept offers of mitigation compared to those who decline them. In particular, respondent sense of place, as measured by the way one appraises their home as well as the level of concern over leaving the neighborhood, appears to significantly shape the mitigation offer decision. This

suggests that place matters. This was corroborated by open-ended responses to the question, "what were the main reasons you accepted/rejected the mitigation offer." Approximately 70 percent of the respondents who had declined the offer of mitigation made statements about not wanting to leave their home or neighborhood even if it was only during the time their house was elevated, which could last many months depending on the specific property condition and workload of available contractors.

A sizeable subset of those who rejected buyout and relocation offers expressed that there was a lack of housing options in the vicinity and that they did not want to "move to a trailer park" or "40 miles away." In booming real estate markets sharp housing prices made it very difficult for repetitive loss homeowners to accept buyouts. A local mitigation official stated:

> If they sell, they have to leave the community, really leave. Take a home in [Site 1]. Say they bought for $200,000 ten years ago. They do all they can to pay the mortgage. We give them 75 percent, $150,000 or so, which is not even a down payment around here. You are talking about a $450,000 mortgage. There is no way.[5]
>
> [R2: 2004]

A local mitigation official at another site added that alternative, flood-proofed housing was hard to find in areas where most of the surrounding region was located in a floodplain. A homeowner's conviction that it was impossible to find alternative housing was further motivated by sentimental attachment to his or her home. This was particularly the case for homeowners who had built their own homes, or who had made substantial improvements. Although improvements added to the value of the home, overbuilding a house in a lower-priced floodplain neighborhood eventually reduced the appraised value. Sometimes these issues made homeowners unwilling to accept the appraised value of their homes so they refused the mitigation offer.

> Then there are people who overbuild their house for the neighborhood. We ran into that not too long ago. She had a $160,000 house but she got a $110,000 neighborhood. They just add-on and build and build and build. Well, we can't give that. But we went out and I was like, "I won't exactly blame her for not selling." She has made the house beautiful. I think the appraisal might have come in at $150 to $160 [thousand]. She might have put, between adding all that stuff, close to that in it. She wanted us to give her $200 [thousand] or more, and we can't do that. We can't if the appraisal comes in at $160 [thousand].

[5] Site names and geographic references have been removed to protect the anonymity of the interviewees.

[R6:2004]

Large properties pose a challenge to mitigation efforts where the cost of land is fairly high, and thus mitigation offers do not properly compensate owners for the price of the land and building.

> One of the things about this area is that the land was relatively cheap here. It is all expensive now. They might have five or six acres there and this old farmhouse which is 50 years old and it is all paid for. If they go to a place like that not in a flood zone it will be very expensive, and that is one of the reasons why we don't hear from them.
>
> [R13:2004]

In yet another site, a local mitigation official spoke about this intersection of sense of place and the economic reality of a strong housing market.

> Even with the lower interest rates there is such a boom in housing now. Even in rehabbing stuff. I would say probably it is a challenge to find a house, especially if everyone thinks their home is their castle. They say, "I can't find anything comparable." There is things out there, but I think there is a lot of components going into "I can't find anything comparable," because there is a lot of sentimental value that they are attached to their house. Like, we had a guy who had built an in ground pool. I mean, you know, a sunroom, a deck. We had the appraiser coming back and saying, "boy was his house nice," and he [the homeowner] is like "no way am I going to be able to find something like this." So if you start making those types of improvements then it's hard.
>
> [R13:2004]

These narratives show how people actively created a sense of place that mitigation officials had to take into consideration. In some cases local mitigation officials stated that this was not a casual attachment, but a real obstacle to negotiation. According to a mitigation official in one community, people in certain areas would only agree to mitigate if strong, trusting bonds were established between local FEMA representatives and the community. The official added that the tie between people and place was so strong that they were synonymous. The two officials explained [2004]:

> R3: A lot of people are people who have lived in these areas all their life, and they just don't want to live anywhere else. They love the community they live in, they like their neighbors. They like the area. They like what the area offers.

> R4: They have to move quite a ways to get out of the flooding. It is not just moving to this other subdivision. I mean a whole area [the site and neighboring county] they all have flooding. It is just the way we live.
>
> R3: I also think the cultural atmosphere ... It is because of things like that that they like the area. They don't want to live anywhere else, you know. And when you get down … that is another different culture altogether. That is all they know.
>
> R4: They had that land three or four generations and it is their only life. Their kids seldom move away. They marry within the county so to speak. They just don't want to leave.
>
> R3: They are pretty close knit. You will find that a lot in this particular area down there. For the most part people down here tend to stick together, and they are not going to let just anyone come in without knowing them.

The officials talked about the importance of building effective linkages with communities by using contacts in neighborhood and civic associations. They claimed that this was absolutely necessary before many of their constituency would take part in some form of structural mitigation. At all sites included in this study local mitigation officials stated that neighborhood community was an important dynamic that directly affected the likelihood of repetitive loss property owner's decision-making process. One official stated, "You do have those who say 'I am kinda tied to this neighborhood, I am tied to my neighbors.' We even had one person who said 'well if my neighbors are not selling I am not selling.' Sure enough the neighbor did not participate and she did not either" [R19:2004].

Overall, sense of place was found to be a significant variable that shaped people's willingness to accept an offer of mitigation. Virtually every local mitigation official that participated in the study stated that mitigating repetitive loss properties, through buyout or structural methods, was dependent upon addressing the sense of place and place attachment. One local official offered an especially compelling narrative that reiterated the idea that places are central building blocks of people's identity.

> We once heard someone describe that when you have your house elevated it is like open-heart surgery and you are awake to see it. It is just so trippy and heart wrenching. So a lot of people don't want to do it for that reason, they are scared of what is going to happen to their house. But if you treat people with some sensitivity, don't lie to them and tell them what is coming up, answer their questions honestly, most people find that okay to work with to move forward.
>
> [R8:2004]

Therefore mitigation officials at the sites visited said that developing relationships with residents and community-based organizations was crucial to the objective of repetitive loss mitigation.

B. The Scale of Helpfulness: Developing Effective Linkages Between State and Society

The helpfulness of the person making the offer of mitigation, typically the mitigation official, was the strongest predictor of mitigation offer acceptance. Repetitive loss property owners and mitigation officials at the local and state levels reported that the ability of a local official to be helpful depended upon FEMA headquarters and regional offices. This was expressed in three ways: 1) creating a more flexible and streamlined project application process to enable officials to respond to the community in a timely and efficient manner; 2) building local capacity (a) to do repetitive loss mitigation work through competitive incentives increasing local government capabilities and decreasing reliance on non-local, private sector companies and (b) establishing trans-local or horizontal learning opportunities; 3) creating social capital between mitigation officials and repetitive loss property owners by integrating neighborhood-based leaders and community-based organizations more fully into the process; and 4) building effective vertical linkages between localities and FEMA in order to foster better articulation among levels of government.

1. Establishing a Flexible and Streamlined Process

Both state and local mitigation officials said bureaucratic redundancies in the process of applying for and conducting repetitive loss mitigation projects created delays in getting projects "off the ground." In addition, respondents stated that greater procedural flexibility was needed in order for officials to respond more effectively to changing project conditions.

> The state needs to have a degree of authority. Right now you can't make a scope change after the application period, which is [from] the date the president declares it [until] four months later, unless you get an extension. We got declared in May. We won't be able to even start in September to do applicant briefings. Maybe four months later we get something back at the local level for executions. The year is gone by, and by that time the homeowners changed their mind then, don't want to do acquisition, want to do elevation. Can't do it! For us that is ridiculous. That is one issue. If there is a degree of flexibility where they would say those types of scope changes can be authorized, as long as it does not impact the environment.
>
> [R16: 2004]

Local and state mitigation officials widely agreed that completion of cost-benefit analysis prior to project approval was not consistent with local needs and priorities. For example, one official discussed a project where they planned to mitigate entire neighborhood. However, FEMA declined funding to the project due to a few properties that did not meet the cost-benefit analysis. The official noted:

> I think FEMA has to do a benefit-cost analysis on the program acquisition of repetitive loss properties but [should] establish a benchmark to say if a property falls in this set of circumstances it will be automatically approved. So if you are in the 100-year floodplain and have three losses, and city wants to make the application, we know that that is going to be approved. So basically laying out the framework for the conditions of what is going to qualify as a cost-effective acquisition. And I think they can do that. They should not do a benefit-cost analysis on each individual piece of property, but a benefit-cost analysis on the project. So I think that streamlining the eligibility upfront would then help a local government target which properties I know I can use this program to help me solve the problem of repetitive flood loss.
>
> [R8: 2004]

Overall, there was a belief that the cost-benefit analysis should be done by project and not at an individual property level. Officials claimed that would provide the needed flexibility to modify components of the project should property owners change their minds regarding participation. Ideally, properties could be substituted without triggering another round of review at multiple government levels.

Many state and local officials said that the reason they wanted a more flexible and streamlined process was that it would provide them the latitude to craft local solutions to repetitive loss issues. Mitigation officials claimed that an inflexible program was leaving people behind to remain in harm's way.

> I really think it is a black and white program. It is either going to work for you or not. So, it would be hard to do anything more. I think it is a really good program and opportunity for people. But there are people that are in tough situations that it just does not work for.
>
> [R1: 2004]

Local and state mitigation officials expressed that their ability to respond effectively to repetitive loss flooding required a flexible and streamlined process, an idea that intersects with a

host of other local issues determining which mitigation strategies are politically and economically viable.

2. Building Local Capacity

At each site mitigation officials suggested that local dynamics could be managed most effectively by proximate stakeholders if they were provided resources and opportunities for capacity building and trans-local (rather than just centralized) learning. Many mitigation program managers at the local and state levels felt that the structure for funding mitigation work favored private consultants and organizations over local governments. Multiple respondents were extremely vocal about this point.

> Why do consultants get to take a 7 percent fee for managing projects but local governments can't? It encourages projects to be managed out of house because local governments don't have the resources. However, if things go wrong, then the local government has to often step in and pick up the pieces. Since they have ultimate responsibility for the projects and to the public, it is preferable to manage them in house should funds be made available.
>
> [R7: 2004]

> Specifically for us, when the decision was made to take this program in house we were not even able to draw down on FEMA money to charge for project management and construction management activities which consultants are able to do. Local communities that say "you know what, we don't want to use a consultant. We want to be more accountable and take the program in-house," are prohibited to even draw on that money. So what incentive does a local community have to take it in-house? They don't. So first of all, local communities don't have the expertise in those programs to do it. And if there is no financial incentive to basically say you can hire a staff person to learn the program and all the time that it takes, what real incentive does the community have to take the program in house. They don't.
>
> [R14: 2004]

> The bottom line is the resources. It is not like we would be asking for any more resources then a consultant would be asking for. I could see if that had an adverse impact on the homeowner, but it wasn't that we would be asking for anything additional. It is justified. We would have someone who is ultimately accountable in the community, who is the grantee, who is ultimately accountable anyway. So the fact that someone says, "hey look, I don't want to rely on a consultant. I want to do the work myself." I mean, to be in a sense penalized because you want to do the work yourself is really bogus. I don't know why they set up the program to be like that, but that is the way it is set up.
>
> [R17: 2004]

All three of these narratives by local mitigation officials questioned the privatization of mitigation activities because they felt the practice worked against local capacity building and ultimately called into question the issue of program accountability to the citizens. In part, officials felt that private consultants did not have the same level of responsibility to the public, which caused a tension whereby local officials were not in charge of the project but faced the possibility of having to pick up a failed effort. Some respondents suggested that non-local private firms would not engender the building of social capital and effective, long-term community linkages that would be needed the next time flooding occurred.

> So, they are going to make it a turnkey operation for some consultant. They are gonna rely on the consultant's knowledge to get the program done right. If it is not done right, the problem is because the community is the grantee of the funds. They [FEMA] are gonna come down and point the finger at the community, and the community might not necessarily be the bad guy. It's just the community saying, "we don't have the expertise, the financial resources to do this, but we know it is an important matter, so we hired a firm in good faith to go up and do this job, to do it properly." We are relying on them and their expertise to do it, and if they don't do it right, who is going to end up paying the price? Yeah, the consultant might be terminated, but whose future FEMA dollars are at risk, the local community.
>
> [R3: 2004]

> There is a sense that FEMA is not sufficiently staffed to manage the program and they are trying to privatize mitigation through contracting. It removes accountability to U.S. citizens. When you have contractors doing local plans, state plans, the same contractors doing reviews, it is like the fox is in the chicken house.
>
> [R13: 2004]

Local mitigation officials believed that trans-local learning through communication with other localities involved in mitigation would foster the creation of local capacity. One official stated that "information sharing between localities with what works and doesn't guides programs" [R8: 2004]. Much of this learning currently occurs within states, but additional mechanisms are needed at the national level. Informal learning also produced some frustration for officials when one locale learned that something their region would not permit them to do was allowed in other regions.

3. Creating Social Capital

Almost all of the local and state mitigation officials spoke about the need to create a sense of trust, or social capital, with property owners and neighborhoods targeted for mitigation. While the structure and manner by which such relationships were developed varied between sites, every local floodplain manager recognized the significance of building positive social relationships. At some sites this took the form of linking to a community through a neighborhood association and working with that group to identify mitigation priorities and strategies. For example, at one site, the mitigation official closely monitored an extensive elevation project as over 20 homes in the neighborhood were mitigated. The following narratives provide a sense of the significance of building neighborhood ties:

> Even though there are a million people here in the county we have kind of a small town way of dealing with each other as people. I think that has a lot to do with how we come across and how people are dealing with us.
>
> [R16: 2004]

> But I think some people are just anti-government, that is all. I have a letter from a guy, handwritten, telling us what a bunch of yahoos we are and that they don't want to deal with people who don't listen. And now his house is in the air and he is a friend of mine and he loves it.
>
> [R9: 2004]

> I am gonna tell you, I have a lot of interface with homeowners associations. Under the CRS [Community Rating System] process you are required to have a repetitive loss plan. This also has a structure you got to follow. You need to have a committee, comprised of county people and citizens, so it forces you to have an interface with homeowner associations.
>
> [R11: 2004]

Most local officials also noted that a sub-population of socially vulnerable repetitive loss property owners might have a more difficult time participating in mitigation efforts. In some cases, it was necessary to be aware of such circumstances and work with them. Paying special attention to the needs of elderly populations was one such example provided by officials at nearly every site. One official recounted an interaction with an elderly man:

> I had one gentleman who was 87 years old and not in good health. And he said, "I just don't want my life disrupted like that while I am 87 years old. I may never see another storm, I might die next week." And when you think about it he had a

> valid point. Because the stress on being moved out of your home and seeing somebody jacking your house up in the air, and when you go in there, there's always damages. Anybody who says not is lying. The walls are going to crack. The ceilings are going to bulge. The ornate woodwork is not going to fit exactly right. You have to go make those cosmetic changes.
>
> [R2: 2004]

Another local mitigation official noted that racial and cultural background influences an individual's perceptions of government and offers of mitigation. She added that programs should work to understand and address these issues.

> Once I step in I try to make them feel comfortable, understanding that no we are not going to take you on a ride. And we have a lot of black folks, and I am sorry but they probably are going to feel comfortable that it is a black face talking to them.
>
> [R3: 2004]

Beyond dealing with socially vulnerable populations, one local mitigation official plainly stated that developing linkages with neighborhood leaders was needed in order to deliver the mitigation offer more successfully.

> We had some people here who were eligible to be elevated but did not want to. I tried to sit down with every one of them who did that. Some you can't talk to. You are from the government. I don't trust you. Get out!
>
> [R20: 2004]

In summary, mitigation officials expressed an interest in learning more about building successful community relationships with targeted repetitive loss neighborhoods and creating local capacity to work effectively with diverse populations.

4. Building Effective Vertical Linkages

Mitigation officials desired opportunities for learning with other locales, but many also felt that more effective linkages for vertical learning needed to be developed to support successful mitigation activities. Both local and state officials stated that procedural elements prevented them from being helpful to property owners. Specifically, creating learning opportunities for all levels of government to understand the local mitigation context was important.

Interviews with local and state mitigation officials indicated a sense of disarticulation between FEMA's repetitive loss mitigation goals and the process that localities had to negotiate

during mitigation efforts. Local and state officials suggested FEMA headquarters staff would benefit from "getting into the field" or developing a mechanism to hear feedback from state and local experiences directly. Local officials stressed their need to be assured that FEMA understood the local context in which their particular mitigation projects took place.

> My problem I have with FEMA headquarters is that they have not been in the field for a long time. They don't understand how it works here at the state level. So if you put out a policy that is going to change the scope of what we do and it does not even pass the smell test; I have problems with that.
>
> [R2: 2004]

> They still got that total disconnect about what it actually takes to deliver a program at the local level. The nuts and bolts of actually making the damn things work, the stuff we talked about. Like he [other local official] mentioned, they don't speak with one organizational voice. There is not a clear methodology, path or answer on programs. There is a lack of organizational memory.
>
> [R16: 2004]

Local and state officials felt strongly that in order for their efforts to be successful, FEMA needed to become more aware of the local context in which they were operating. Many respondents added that direct learning opportunities to obtain the experiential knowledge of those "on the ground" could help change policies to make them more effective. According to these officials, current policies were inconsistent and not articulated well within the local mitigation context.

> I don't mind implementing rules if I know what they are upfront, but don't make them up as you go along, and don't change the rule in the middle of a project that pulls the rug out underneath our ability to successfully run the program and the local government's ability to mitigate future losses.
>
> [R19: 2004]

> Each time a FEMA reviewer imparts [his or her] own perspective into the process it changes what we can do. The other thing you are going to hear is that there is no consistency within the region, between the regions, and between the regions and headquarters across the country in the interpretation of this program and how it should be implemented.
>
> [R4: 2004]

These narratives from mitigation officials at the local and state levels indicated the importance of creating learning opportunities in order to build effective vertical linkages. This

issue supports the previous discussion within this paper documenting local officials' concerns with the increased reliance on private consultants and firms to operate local mitigation programs, because this approach does not create the enabling conditions for program continuity over a longer timeframe. Local officials conceptually connected efforts to build local capacity, opportunities for vertical learning and establishing "institutional memory" with federal goals to provide continuity in decision-making and policy interpretation.

C. Site Match

Both state and local mitigation officials stated that funding was ultimately the most important factor limiting their ability to conduct repetitive loss mitigation initiatives because it determined much of what could be done. This statement was supported by the logistic regression analysis, which showed that economic factors are predictive of homeowner decision-making. Sites that were able to provide the 25 percent match for mitigation projects saw a dramatic increase in homeowner participation. This was the strongest predictive variable impacting the decision of property owners to mitigate, and was corroborated by interviews with mitigation officials. All officials said that when the state government cannot fill the 25 percent gap, the cost seems to be a barrier for many property owners. In response to the question, why do people decline offers of mitigation, one official replied:

> Money! Money! The cost. It is prohibitive, and I tell them up front when they submit an application that this is not an inexpensive process. And they say 'Man, give me an idea how much per square foot.' I say, 'I am gonna tell you I have seen them run as low as $40/s.q. foot and as high as $85/s.q. foot.' [At] $85 per square foot, you can almost build a brand new house.
>
> [R1: 2004]

> I would say, nine out of ten times it is finances. Bottom line is they like to do it, but they don't have the cash readily available. They would prefer to go with a buyout but they might have a second mortgage that prohibits them from doing it, because by the time they do the buyout they walk away with nothing, or they walk away owing something. So they are out of a home and they still are paying on something. So buyout is not an option. And with a second story conversion they might want to do it, but they might just be able to afford to get the loan to do what they need to do. So, more times than not, it is financing.
>
> [R12: 2004]

Funding constraints decreased the likelihood of conducting a mitigation project effectively, not only with the issue of the 25 percent match, but in other ways as well. Some sites in strong housing markets stated that the level of FEMA funding for mitigation was not realistic.

> When we deal with FEMA on these things they think we are making it up. It is really what it costs. In terms of the permitting process, our county has probably one of the strictest and most comprehensive environmental regulations in the country. It is convoluted, time consuming, expensive. We have properties on the coast at a million bucks starting price. You got coastal development regulations from the county, from the state. It is a national marine sanctuary out there. If you talk about elevation on the coast, you are talking about multimillion dollar properties and three years permitting and extensive studies, huge amounts of money. So when we get these grants of $600,000, it sounds great in Washington somewhere, but here it is one, maybe two, properties. To actually do mitigation it is going to take vastly greater amounts of money.
>
> [R16: 2004]

Several other sites in this study also perceived the strong housing market as an impediment to mitigation activities. The strengthening housing market created problems in terms of finding alternative housing, as discussed above, and also decreased the number of properties within projects that could be mitigated with grant funding.

State and local mitigation officials also noted the time consuming nature of the funding process and, for some, it was almost not worth the time and effort it took to complete the application process. Some officials considered that the reduction of HMGP mitigation funds from 15 percent to 7.5 percent is the cause of the funding gap for staffing mitigation at the state and local levels. They added that replacing this funding stream with the competitive PDM program enhanced reliance on private consultants and diverted resources from local capacity building to the private sector. As stated before, some mitigation officials felt that this private sector involvement was problematic because it had the potential to decrease fiscal and social responsibility to taxpayers. In addition, one site claimed that relying on non-local, private sector consultants placed the welfare of citizens in the hands of market competition that was primarily interested in making a profit as opposed to establishing a long-term commitment to the community.

IMPLICATIONS AND POLICY SUGGESTIONS

This study examined the factors that shape the decision-making process of repetitive loss property owners when considering mitigation offers. The household survey results used in the statistical model together with the mitigation official interviews indicated four broad factors that are significant variables in property owner decision-making.

The availability of a **Site Match** to provide the 25 percent non-federal funds was the strongest predictor in the model. When a site was able to provide the 25 percent match to the repetitive loss property owner, they were 6.5 times more likely to accept an offer than sites where this was not the case. State and local officials emphatically also stated that funding of programs was one, if not the most, significant barrier to making an attractive offer of mitigation to repetitive loss households. Those sites that could provide the match to repetitive loss households were much more likely to have successful mitigation programs. Officials felt that if these funds could be provided by FEMA, then more properties would be mitigated. Current legislation, which stipulates the possibility of decreasing the match to ten percent in some cases, seems to be consistent with the reports from states and localities that the match has been a barrier to accepting an offer of mitigation.

Sense of Place, measured as property owner's perception of property condition and attachment to neighborhood, was negatively associated with accepting an offer of mitigation. Local officials reported that people's attachment to their neighborhood and home were both important to address when making an offer of mitigation. Local housing market context was also a significant factor in making a decision to mitigate a property. In many cases finding an alternative home or temporary housing during a structural adjustment to one's home was reported to be a challenge. In part, this was attributed to a strong housing market, and in other cases where the floodplain extended for miles around the locale, finding a flood-proofed property was difficult. Interviews with mitigation officials suggested that when people had previously invested in maintaining their home it was more difficult to mitigate. Officials also noted that working with neighborhood and community-based organizations was an effective strategy for building trusting relationships between mitigation officials and property owners.

Helpfulness was also important to mitigation efforts. When repetitive loss property owners felt that the mitigation official making the offer was helpful, they were 5.2 times more likely to accept the mitigation offer. State and local mitigation officials suggested that they could only be

as helpful as the structure of the mitigation program would promote. Therefore, the "scale" of helpfulness extended beyond the relationship between the repetitive loss property owner and the local mitigation official to state, region, and federal levels of government (and private sector).

Three factors critically influenced the ability of mitigation officials to be helpful. First, greater local autonomy and a ***streamlined application approval process*** fostering the creation of site-specific and time-sensitive local solutions was expected to increase the helpfulness of officials and raise homeowner participation rates. Officials reported that developing effective linkages between localities and FEMA whereby dedicated funding streams would reflect the needs of sites that had very different local contexts (i.e., housing market, jurisdictional policies, state economic condition). State and local officials voiced parallel concerns about cumbersome and inflexible application procedures to obtain mitigation support. Officials wanted FEMA to create policies that would enable localities to craft mitigation strategies that reflected ever-changing conditions. This included creating project-based cost-benefit requirements for sites as opposed to parcel-based, and being able to modify approved projects as needed.

Second, officials reported that FEMA's current funding structure for mitigation programs at the state and local levels increased public sector reliance on non-local, private sector firms rather than ***building local capacity***. Officials viewed this approach as a hindrance to creating a sustainable mitigation program that would be responsible to citizens. In this context, local and state mitigation officials felt that the increasingly competitive nature of acquiring funding (i.e., PDM program) really promoted a "survival of the fittest" climate and extended market logic into a domain of social welfare that should be operated/directed by local government officials who are beholden to citizens.

Third, officials noted that ***building social capital*** through working with neighborhood and community-based organizations was one of the most effective strategies for building mutually beneficial partnerships, notably by giving the official legitimacy within the community, and by providing the community an outlet for their collective concerns. Fourth, officials wanted to ***extend horizontal as well as vertical learning opportunities*** to find out what strategies were effective in other sites and how these were implemented. There was also widespread belief on the part of state and local mitigation officials that FEMA staff needed to get out "into the field" more in order to understand the ramifications of current policy and to learn from direct experience of localities.

Demographic variables were also significant. Compared to high-income households, medium-income households were less likely to accept an offer of mitigation. Households with children were also less likely to accept an offer of mitigation. It may be that low-income households can apply for assistance to obtain a 25 percent match for federal funds and higher-income households already have access to economic resources to provide a match, but medium-income households may experience a barrier due to the required match.

Based upon the data analysis and findings the following policy suggestions are provided to FEMA for consideration:

- Create mechanisms to dedicate funding streams for mitigation that permit flexible or no-cost sharing, and thus alleviate the 25 percent match requirement burden on the homeowner.

- Inquire into exactly how localities are building neighborhood-based linkages, and how these may support mitigation goals. Ideally, this information should be compiled and disseminated across the country.

- Create sustainable local mitigation programs with strategies that provide cities, counties and states with support and incentives to build local capacity, as opposed to relying on non-local, private sector organizations.

- Reduce project-approval delays through streamlining the application process. Further research is required to gather a national dataset for the purposes of systematically examining a wide range of local contexts and modeling site variables. This model could be used to develop a range of mitigation opportunities for different types of places.

- Develop learning opportunities for localities to exchange information with one another regarding best practices.

- Provide mechanisms to increase the direct exchange of experiential learning and knowledge between different levels of government for a more seamless implementation of mitigation policies.

- Create flexibility for localities to develop mitigation projects that intersect with other land-use goals (neighborhood level mitigation projects), and the ability to modify projects as necessary.

- Develop ways to work with localities that have special circumstances (including strong housing markets and land-use regulations, among others) that hinder implementing mitigation activities.

APPENDIX A

Table 3. Zero Order Correlations Between Independent and Dependent Variables.

Variables	1	2	3	4	5a	5b	5c	6	7
Independent Variables									
Sense of Place									
1. Property Condition		0.064	0.032	-0.193 **	-0.165 *	0.066	0.074	0.115	-0.235 **
2. Neighborhood Attachment	0.064		-0.029	-0.118	0.023	0.012	-0.034	0.078	-0.202 **
Process/ Program									
3. Helpfulness	0.032	-0.029		0.054	-0.043	0.080	-0.051	-0.129 *	0.254 **
4. Site Match	-0.193 **	-0.118	0.054		0.256 **	-0.055	-0.169 **	-0.133 *	0.374 **
Demographic									
5. Income									
a. Low Income	-0.165 *	0.023	-0.043	0.256**		-0.536 **	-0.292 **	-0.205 **	0.164 *
b. Medium Income	0.066	0.012	0.080	-0.055	-0.536 **		-0.651 **	-0.012	-0.115
c. High	0.074	-0.034	-0.051	-0.169**	-0.292**	-0.651**		0.199 **	-0.164 *

Income									0.017
6. Children	0.115	0.078	-0.129 *	-0.133 *	-0.205 **	-0.012	0.199 **		-0.198
Dependent Variable									
7. Mitigation Decision	-0.235 **	-0.202 **	0.254 **	0.374 **	0.164 *	-0.115	-0.017	-0.198	

** p< .001, * p< .01; Dependent variables are variables 1 to 6, independent variable is variable 7.

APPENDIX B

Figure 2. Map of Counties with Repetitive Loss Properties.

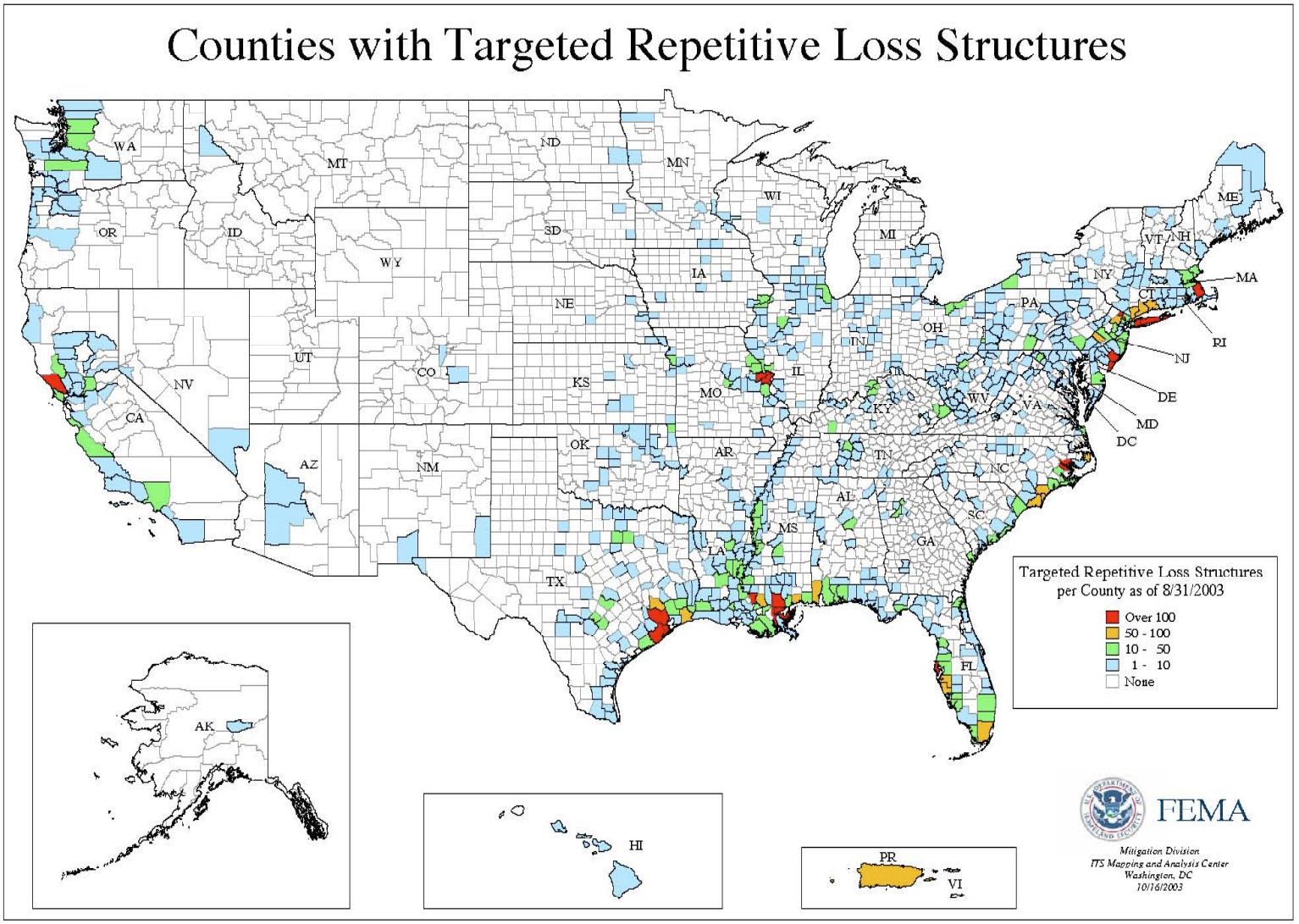

Figure 3. Map of Repetitive Loss Study Sites.

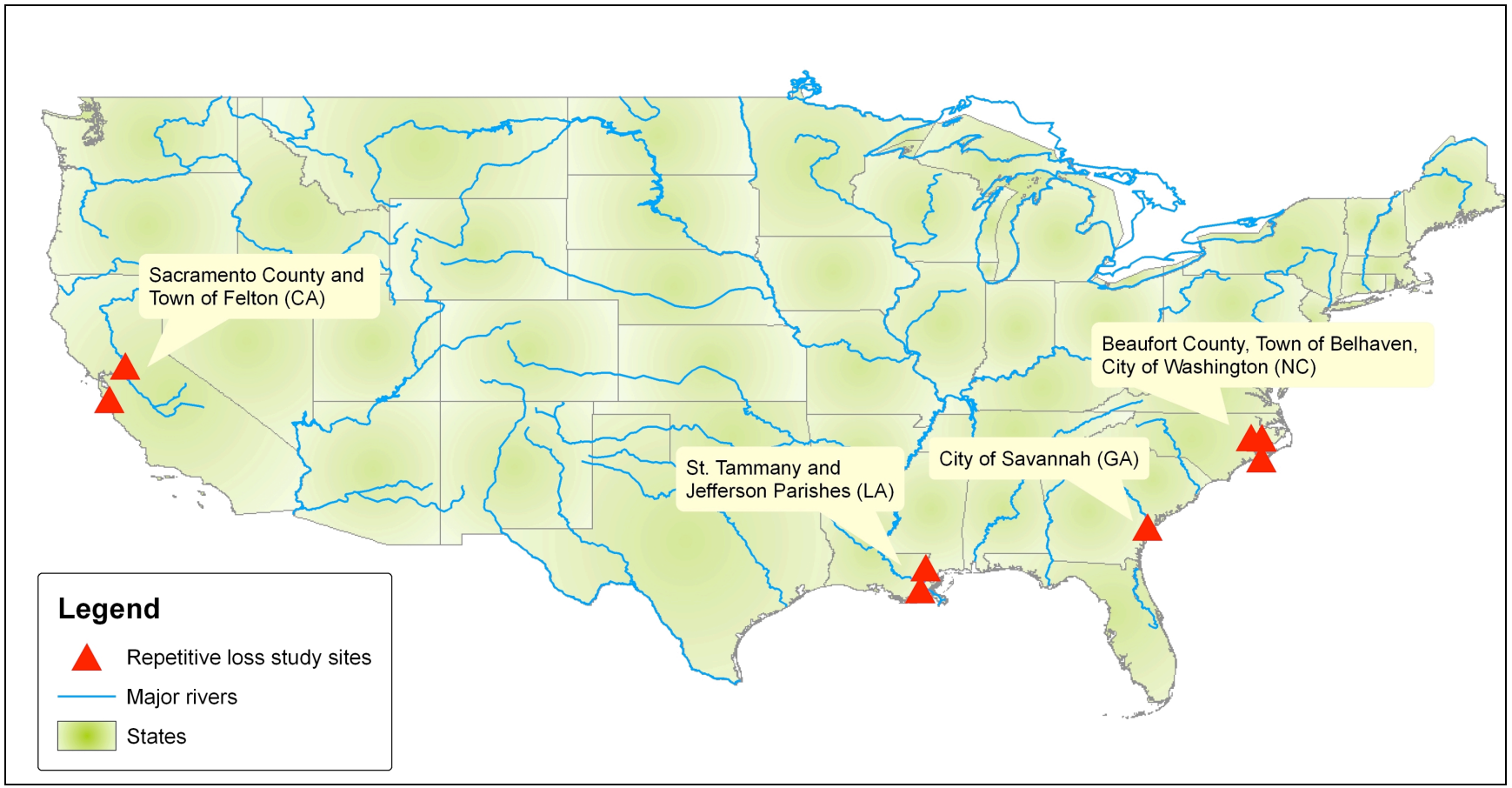

Table 4. Population, Characteristics, Mitigation History, and Survey Numbers for Selected Study Sites.

Community	Jefferson Parish	St Tammany Parish	Sacramento County	Town of Felton	Beaufort County	Town of Belhaven	City of Washington	City of Savannah
State	LA	LA	CA	CA	NC	NC	NC	GA
FEMA Region	6	6	9	9	4	4	4	4
Repetitive flooding source	severe rainfall	severe rainfall	riverine	riverine	coastal, riverine	coastal	coastal, riverine	coastal, riverine
Population[1]	455,466	191,268	1,223,499	1,051	44,958	1,968	9,583	131,510
% White[1]	70%	87%	64%	91%	68%	37%	52%	39%
% Black[1]	23%	10%	10%	1%	29%	61%	45%	57%
% Hispanic[1]	7%	2%	16%	7%	3%	3%	3%	2%
% Rural[1]	1%	25%	2%	0%	68%	100%	2%	1%
Median age[1]	35.9	36.3	33.8	34.3	40.2	40.6	39.5	32.3
Housing units[1]	187,907	75,398	474,814	517	22,139	1,015	4,399	57,437
% Vacant housing[1]	6%	8%	4%	24%	17%	19%	10%	11%
Median household income	$38,435	$47,883	$43,816	$48,102	$31,066	$22,057	$16,674	$29,038
Historical repetitive loss properties[2]	5,755	853	114	No data	675	297	136	317
Actual repetitive loss properties[2]	5,724	851	83	15	637	198	112	218
% Repetitive loss housing	3.1%	1.1%	0.02%	2.9%	2.9%	19.5%	2.5%	0.4%
Federal share buyouts / elevations[4]	$3,426,566	$7,804,402	No data	No data	$7,763,188	$7,040,553	$3,342,281	$14,654,372
Total approved buyouts / elevations[4]	11	52	No data	No data	223	376	110	385
CRS Class[3]	7	9	5	None	8	8	8	8
Available phone numbers [5]	45	46	192	21	101	369	61	46
Rep. Loss homeowners surveyed	21	18	63	6	35	59	17	18

[1] U.S. 2000 Census; [2]As of February 29 2004; [3] As of May 1 2003 all NFIP, not only repetitive loss; [4] As of December 2003; [5] Homeowners offered mitigation

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