

Natural Hazard Research

SULLIVAN'S ISLAND, SOUTH CAROLINA

THE HURRICANE HUGO EXPERIENCE:
THE FIRST NINE MONTHS

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PREFACE

This paper is one of a series on research in progress in the field of human adjustments to natural hazards. The Natural Hazards Working Paper Series is intended to aid the rapid distribution of research findings and information. Publication in the series is open to all hazards researchers and does not preclude more formal publication. Indeed, reader response to a publication in this series can be used to improve papers for submission to journal or book publishers.

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SUMMARY

Hurricane Hugo smashed into the South Carolina coast on the night of September 21-22, 1989. The eye passed directly over Sullivan's Island. Winds gusting up to 140 miles an hour savaged property and snapped the only bridge connecting the barrier islands to the mainland. For approximately an hour, Sullivan's Island disappeared under a two to three mile an hour storm surge rising 15 feet above high tide and traveling at two to three miles an hour. Emergency decrees kept islanders from returning once the storm had passed. When residents were allowed back, under strict controls, they saw the damage and destruction first hand. No building was untouched. Individual losses differed only in degree. That was just the beginning.

This preliminary report assesses some effects of Hurricane Hugo on residents of Sullivan's Island, a barrier island township lying just north of Charleston Harbor, where the authors live. The Hugo study began once we were able to take care of our own post-hurricane problems. We obtained a small Citadel Development Foundation grant to study the island experience. In time, our approach became conditioned by the fact that in most disaster studies sample sizes are relatively small compared to the affected population, a reflection of the great difficulty in finding populations to survey without contaminating the results. With the dubious advantage of being island residents who had shared the subject population's experience, we chose to cast a very wide net, employing a lengthy mail questionnaire because we hoped to reach a substantial segment of the population, wanted a wide range of data, and felt the technique was sound in situations where interest in the subject of a questionnaire is high, the condition on the island after the hurricane. Nine months after the storm we contacted about 634 residents and property owners, all those who could be reached at the time, with a 12-page mail questionnaire. Some 274 completed questionnaires (43.2%) were returned, a high rate.

Data analyses provide a number of observations. The hurricane had a pronounced effect in raising stress levels. The increases in stress related to the amount of physical damage to property, absences from work to take care of family and property, marital status, membership in a dual career couple, and how one fared in dealing with insurance companies. For a substantial number of people, the impact of these factors and the cumulative effect of household disruptions, problems in repairing or rebuilding homes and businesses, and increased demands on time meant that coping with Hurricane Hugo was a more stressful experience than dealing with such important life events as separation, divorce, the death of a friend, or the loss of one's job.

Dealing with insurance companies was difficult for many and an important stressor. Nine of every ten islanders had wind or homeowners insurance coverage and nearly two-thirds carried flood insurance on buildings before the storm, but fewer than half the people had their personal property insured against flood damage. Although three claims out of every four were settled within four months, only half the people said they were satisfied or extremely satisfied with their settlements. A majority of policyholders experienced at least some problems with the insurance companies, and nearly one policyholder in six had a bad insurance experience. Better than a third of all policyholders changed insurance companies since the hurricane. There were no differences in experiences of islanders among the national insurance carriers.

Government action in barring residents from returning immediately to view or mitigate the damage to their property was controversial when it was ordered, polarizing the community for a time, and some of its effects may be lasting.

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SULLIVAN'S ISLAND, SOUTH CAROLINA

THE HURRICANE HUGO EXPERIENCE: THE FIRST NINE MONTHS

THE SETTING

Hurricane Hugo was the worst hurricane to batter South Carolina since 1872 and, until 1992's Hurricane Andrew, the strongest storm to strike the United States since 1969. Packing winds estimated at 90-100 mph at ground level, 120-125 mph in the eye wall, and gusts 25% higher, Hurricane Hugo rode ashore at 25 mph between 11:00 p.m. and midnight on September 21, 1989. The strongest winds were experienced on Sullivan's Island and the Isle of Palms, barrier islands lying just north of the Charleston, South Carolina, harbor, where the eye of the storm crossed. The accompanying storm surge rose 13.5-15 feet above mean sea level at Sullivan's Island, submerging it for a time (Brennan, 1991; Coch and Wolff, 1991). Hugo caused some \$8 billion in property loss, of which approximately \$4.5 billion was insured (*New York Times*, September 2, 1992). On the barrier islands, no lives were lost because people heeded advance warnings and evacuated. The storm confirmed predictions made a year earlier about the destruction a high magnitude hurricane would wreck on the Carolina coast (Sill, Sparks, and Hayter, 1988). None of the approximately 923 buildings on Sullivan's Island escaped damage. Fifty-nine were torn down or scheduled for demolition and some 600 building permits totaling nearly \$15.7 million were issued in the first year after the storm. (Berkeley-Charleston-Dorchester Council of Governments, 1990b).

Sullivan's Island and the Isle of Palms are joined together by a fixed span bridge across Breech Inlet and connected to the mainland from Sullivan's Island by a single road and the aging Ben Sawyer drawbridge that spans the intracoastal waterway. In the 1970s, issues of easier access to the beaches, a second evacuation route from the islands, and a strong push for commercial and real estate development on the Isle of Palms led the South Carolina Highway Department to recommend replacing the Ben Sawyer drawbridge with a fixed span structure and widening the main thoroughfare across Sullivan's Island. Sullivan's Islanders energetically opposed the plan because they feared the impact of increased traffic and development. (*Parents Magazine* had rated largely residential Sullivan's Island--with its prohibitions against dividing lots, new commercial establishments, and high rise and multiple family dwellings--as one of the four most desirable places nationwide to rear children.) When the South Carolina Legislature enacted special legislation to allow the highway department to proceed with road and bridge construction without local government approval, Sullivan's Island Township responded with a lawsuit and won in the South Carolina Supreme Court a judgment that nowhere in the state could a bridge be built within corporate limits without the consent of local government. That halted the plan to replace the Ben Sawyer Bridge with a fixed span structure.

Attention then shifted to building a new fixed span connector from the mainland to the Isle of Palms--the alternative Sullivan's Island residents had favored all along. For reasons similar to those which had motivated Sullivan's Islanders, many Isle of Palms residents opposed the connector project. For years, the locally important and controversial political issues were followed closely on both islands. In mid-September 1989, the Isle of Palms municipal government held an advisory referendum on building the connector, and a majority of council members pledged in advance to abide by the results. The referendum returned a thin majority favoring the connector construction. Hurricane Hugo hit the following week.

The hurricane dumped the drawbridge connecting Sullivan's Island into the intracoastal waterway. Television pictures of the forlorn Ben Sawyer Bridge, one end mired in the waterway, the other pointing vainly skyward, became a visual national symbol of Hugo's force. More important locally, neither island was prepared to deal with a natural disaster that downed the single bridge connecting them to the mainland.

The broken bridge made life after the hurricane different for islanders. Mainland residents who stayed through the hurricane or took shelter in nearby communities were able to get back to their homes, camp out, and begin makeshift repairs. Police, coast guard, and national guard troops barred barrier island residents from returning by boat. Some did not know for days whether or not their homes still stood. Islanders watched from afar as hard rains inflicted further damage to their property, vented their frustrations in emergency town meetings called in neighboring Mt. Pleasant, South Carolina, pressed to be allowed back to their homes and property, and organized emergency boat lifts when they could.

PREVIOUS RESEARCH

Hazards

As any number of research studies have pointed out, complex hazard mitigation and disaster studies designed to assess attitudes of large groups are difficult to plan and carry out (Soloman, 1989; Powell and Penick, 1983). The constraints of hazards research affect studies employing mail questionnaires and standardized interview techniques alike (Logue, Hansen, and Struening, 1979; Ollendick and Hoffmann, 1982; Parker, 1979; Fogleman and Parenton, 1959; Baker et al., 1976; Simpson-Housley et al., 1982; Brinkmann, 1975). Consequently, we still have much to understand (Mitchell 1990; Smithson, 1990). Despite the problems, post-disaster studies are particularly useful (Mittler, 1989), especially when they replace myths about what people do and do not do in disasters with facts derived from data (Beatley and Brower, 1986; Fischer, 1989; Dynes and Quarantelli, 1972).

Stress Effects

For individuals, crisis may bring on an emotional state of shock, temporary paralysis, or physiological and motor symptoms associated with acute fear (Selye, 1983; Hill, 1965; Kubler-Ross, 1969). During a crisis and for better than a year after, one may experience a general reduced tolerance for ambiguity and perceptual accuracy. The impact can differ by gender (Krause, 1987). Crisis theory predicts that the effects of life events depend on how the crisis is resolved (Caplan, 1964). The largest pool of information on the stress impact of a crisis comes from research studies focusing on total life stress, meaning events which usually occur in a short period of time, like the death of a spouse or separation and divorce (Burke and Bradshaw, 1981; Burke, 1986). Life events differ in impact and intensity and are related to demographics, social support systems (Gore, 1987), and a host of moderators (Kessler and McLeod, 1985), including whether an individual feels some sense of control over the situation (Cowen, 1985). Most life events are expected occurrences.

Work and Income-Related Stress

Specific research has examined work-related stress (Brodzinski, Scherer, and Goyer, 1989; Starr, 1990) and its close companion, income-related stress (Price, 1985; Dooley and Catalano, 1984; Gore, 1987). Variables identified as affecting the impact of work or income-related stress include age and marital status (Bolin and Klenow, 1983; 1988), available social support (Munton, 1990; Dooley, Rook and Catalano, 1987; Cohen and Wills 1985), and mobility (Dean, 1990).

Stress and Disasters

Studies of long term stress, which includes post-disaster stress, are fewer, and there is less agreement on the impacts (Krause, 1987; Ollendick and Hoffmann, 1982; Greenhaus and Parasuraman, 1986; Greenhaus and Beutell, 1985). There is little doubt, however, that natural disasters are especially stressful. They affect health by increasing susceptibility to illness (Phifer, Kaniasty, and Norris, 1988). When direct effects are prolonged, there is increasing physiological wear and tear (Selye, 1983; Phifer, Kaniasty, and Norris 1988). Indirect effects may appear, a consequence of altered behavior patterns (Mechanic, 1977; Hutchins and Norris, 1989). Victims of natural disasters tend to be more stressed after the disaster than before (Phifer, Kaniasty, and Norris, 1988).

The impact of a natural disaster on the level of perceived stress or its relationship to other life events is not well understood, possibly because much of the research on major life event stressors takes place very close to the time of the stressful event, increasing the measurement difficulty (Krause, 1987). Natural disasters have been shown to be especially stressful (Ollendick and Hoffmann, 1982; Phifer, Kaniasty, and Norris, 1988; Hutchins and Norris, 1989). Stress varies in intensity depending on demographics such as age and sex. The level of physical loss and damage plays a role, as does the ability to control loss with prior planning, such as buying insurance, and after-disaster actions, like plunging into work to recover from the crisis.

Property Damage and Insurance Coverage

Property damage is the most measurable impact of a modern-day hurricane in the United States. Losses of substantial, long-term investments in homes and businesses have been shown to be damaging both financially and psychologically (U.S. Office of Technology Assessment, 1979). Widespread loss can affect entire communities (Leighton, 1945). People commonly buy insurance policies to protect against fire or wind damage. But flood damage is responsible for about 80% of the property losses in the United States, and affordable flood insurance is relatively new and not routinely purchased (Rose, 1988). Even in many high hazard areas, participation in the federally subsidized flood insurance program is not nearly as widespread as people suppose (Petak, Atkinson, and Gleye, 1978; Sturgess and McHugh, 1988).

In the Flood Disaster Protection Acts of 1968 and 1973 (Moore and Moore, 1989; 1991), Congress gave identified flood-prone communities the choice of employing combined land use planning and enforcement of building codes or forfeiting federally subsidized flood insurance. Institutions handling loans under the VA, FHA, and HUD programs, or loans which were federally insured, regulated, or supervised, required borrowers to purchase the policies. The coercive elements worked in covering new properties and mortgages, but people with existing homes and mortgages at the time a community entered

the federal flood insurance program could choose not to purchase the flood insurance. Absent personal experience with a natural disaster themselves, some people lacked any incentive to purchase flood insurance. This lack of interest on the part of property owners was matched by relative inattentiveness on the part of insurance companies. Agents receive little commission from marketing the federally backed coverage, and do little more than mention its availability. Thus, although flood coverage increased, beginning in 1979 with establishment of the Federal Emergency Management Agency (FEMA) to manage the National Flood Insurance Program, there was considerable indifference to the available protection (Rankin, 1989). Minimum insurance protection in the coastal zone means having the separate insurance policies necessary to cover both wind-related and flood-related damage to structures and contents. But people did not routinely purchase flood policies (Rose, 1988), and even in many high hazard areas participation in the federally subsidized program was not widespread (Petak, Atkisson, and Gleye, 1978; Rankin, 1989), except as required of lending organizations (Sturgess and McHugh, 1988). It was also important for policyholders to have enough hazard insurance in force, but when property values appreciated rapidly, as they did in coastal communities over the last decade, not all homeowners kept up (Arnell, 1983).

Property Damage and Insurance Claims

Filing insurance claims after a disaster can prove trying. Insurance companies pay only under the terms in policies, which means they have a strong incentive to limit exposures by precise language. Policyholders may discover the exclusions only after an emergency. Concerned about insurance fraud, companies can be excessively careful when handling claims (Anderson, 1990; Crawford, 1991), frustrating policyholders who want an immediate response. Not all property owners make the extensive, pre-disaster preparations necessary to facilitate handling insurance claims they may have in the future (What Hugo Taught, 1990). As a result, some disaster victims find that they did not have enough insurance or appropriate coverage, particularly for flood losses. The reasons may be because they had not acquired the necessary information (Tierney, 1989), or discovered too late that they were underinsured because after a lengthy period of inflation they had not increased coverage on the property to keep pace (Arnell, 1983), or because they learned first hand about gaps in coverage, a problem in the federally insured flood insurance program (Federau, 1987). While some studies suggest that major disasters do not lead to long term community economic losses (Friesema et al., 1979), the fact that numbers of individuals are badly injured financially is beyond dispute. Many of those thought before the disaster that they were protected.

Government Operations

Immediately after natural disasters, municipal governments face a tremendous overload of decision making and administrative work (Rubin, Saperstein, and Barbee, 1985). Officials usually perceive only a narrow range of options (Rosenthal, 1989). They often act on the basis of widespread myths of maladaptive behavior (Auf Der Heide, 1989), particularly ideas that widespread looting and price gouging are omnipresent post-disaster phenomena (Fischer, 1989; Dynes and Quarantelli, 1972) and that without outside aid and government direction residents in stricken areas are helpless to avoid personal danger and injury or to help themselves in meaningful ways (Dynes and Quarantelli, 1972; Tierney, 1989). Partly for these reasons, authorities may exhibit little or no confidence in disaster-affected populations (McBride, 1979). Restricting access to impacted areas long after the real dangers to the population have ended is commonly done (Mileti, 1975). People in disaster areas share their own misperceptions. When the national guard or other military units are called in to assist local governments, the assumption is that martial law has been imposed (Wenger, Faupel, and James, 1980). In fact, there is no known case of a disaster in the United States where a declaration of martial law has been made (Anderson, 1970).

RESEARCH QUESTIONS AND HYPOTHESES

Stress Hypotheses

The study compared other major life stressors experienced by Sullivan's Islanders to the hurricane effect of the perceived change in stress. Variables included age, sex, support systems, property loss, and other storm-related factors. Prior findings suggest that victims of natural disasters will be more stressed after the disaster than before it, that the stress will diminish over time (Phifer, Kaniasty, and Norris, 1988), and that the greatest peak in felt stress will occur at the beginning of a new disaster season and vary in intensity depending on previous disaster experiences. Other research suggests age may also be a factor.

Personal Safety Stress. The literature suggests, although this has not been specifically tested, that experience with disaster increases the stress concerning the potential harmful effects of another occurrence. This association is tested here by pre/post measures of the degree of concern in three areas:

- HO1: The perceived stress on initially hearing the warnings to leave the barrier island pre-Hugo will be less than the perceived stress on returning to the island post-Hugo.
- HO2: The level of concern about living on a barrier island pre-Hugo will be less than the concern post-Hugo.
- HO3: The concern for the security of evacuation routes pre-Hugo will be less than the concern post-Hugo.

Perceived Change in Stress Levels. Previous findings indicate that the index of perceived change in stress may best be predicted by age, marital status, dual career couple status, time out of residence, ownership and residential status, total damage to property and contents, the amount of that damage covered by insurance, and satisfaction with insurance company settlements. Specific hypotheses tested are:

- HO1: The total change in stress among those who are primary residents on the island (whether property owners or not) is best predicted by absences from work, marital status, dual career status, and total damage incurred.
- HO2a. The total change in stress among property owners who are not residents on the island may best be predicted by total damage, marital status, whether members of a dual career couple, and the number of absences from work to repair or look after the property.
- HO2b. The total change in stress among those who are primary residents and property owners may best be predicted by the length of time residing on the island, the number of absences from their jobs to repair or take care of people and property in the aftermath of the storm, marital status, dual career couple status, total damage, and the level of satisfaction with their insurance company settlements.

- HO3: The total perceived change in stress among older primary residents may best be predicted by marital status, dual career membership, total damage to property, insurance coverage, time out of property, and number of absences from work. (Unless otherwise stated, older residents are defined in this study as people over 65).

Life Events Hypotheses

Phifer, Kaniasty, and Norris (1988) found flood exposure to be "related to modest health declines with symptoms appearing seasonally, peaking in the first spring after the incident," which coincided with high personal losses and community destruction. In a study of the impact of major life events, Hutchins and Norris (1989) found that older flood victims were more likely than other older adults to experience social disruption than household, financial, family conflict, and the like. The hypotheses on life events at the outset of the new hurricane season were tested by examining how many life event stressors and disaster-related life events participants checked and how the two sets related. Tested were:

- HO1: The impact of Hurricane Hugo will be considered more severe than other life events as stressors for those in the high and low damage groups as compared to those in the moderate loss group and this will be attributed to household disruptions (i.e., problems of rebuilding, contractor misrepresentation, dealing with insurance companies, contractors in general, increased demands on time).
- HO2: There will not be a significant difference in the ratings of Hurricane Hugo as more stressful than other life events for older adults and this will be attributed to the classification of items relating to personal life rather than household events.
- HO3: Hurricane Hugo in general will be considered more stressful for those with a high level of damage who have gone through the storm than other life events.

Insurance Hypotheses

This part of the study examines the insurance status of island residents at the time of the storm, changes in insurance coverage after the storm, and perceptions of insurance company treatment, particularly with regard to fairness and satisfaction with claims settlements. Hypotheses tested are:

- HO1: On Sullivan's Island, owners whose property is also their primary residence will tend to be less satisfied with insurance company treatment than non-resident owners.
- HO2: Level of satisfaction with insurance company treatment will be lower for those with heavier levels of damage than for those with lower levels of damage.
- HO3: Property owners with massive losses and who are covered by more than one insurance company will perceive their treatment to be more severe and have a lower level of satisfaction with the insurance companies than those with a single insurance carrier.

- HO4: Satisfaction levels will vary with demographic factors such as age, length of residence on the island, and family composition, and also with any actions the policyholder had to take to try and obtain a satisfactory settlement. The length of property ownership, the grandfather clauses in federal laws permitting exemptions from flood insurance coverage, and the age of the owner would all be major contributing factors in appropriate insurance coverage for damage.
- HO5: Owners' flood insurance coverage will be less extensive than homeowner (wind) damage protection.
- HO6: Many island residents will not have sufficient coverage to protect against the damages to their properties because they did not keep their insurance policies up-to-date as property values increased.
- HO7: After the disaster, people owning property on the island will increase their insurance coverage and seek greater consultation on exactly what their policies will and will not cover.

Government Actions

Respondents were asked two sets of five questions about their feelings regarding the restrictions on access to the island that were imposed after the storm.

- Q1: (At the time/In retrospect), (I felt/feel) that martial law¹ was a necessary precautionary measure.
- Q2. (At the time/In retrospect), (I felt/feel) that martial law was necessary in order to get cost-of-living expenses during the evacuation phase from the island.
- Q3. (At the time/In retrospect), (I felt/feel) that martial law interfered with my personal rights to return and examine damage to my property.
- Q4. (At the time/In retrospect), (I felt/feel) a sense of anger and frustration that martial law kept me away from making the necessary repairs to my property.
- Q5. (At the time/In retrospect), (I felt/feel) a sense of resentment toward the town for the absence of more citizen voice in decisions impacting our lives immediately after the hurricane.

¹As noted above, there never has been a declaration of martial law after a natural disaster in the United States. However, because national guard and federal troops are present on the scene, the term gains common usage during crises. After Hugo, for example, radio and television broadcasts regularly described the barrier islands as being under martial law. The shorthand term was carried over into the questionnaire because everyone knew exactly what it meant.

METHODOLOGY AND RESEARCH QUESTIONS

Approach

In many disaster studies, sample sizes are small, a reflection of the great difficulty of finding post-disaster populations to survey without the limitations imposed on research affecting results (Powell and Penick, 1983). Any number of studies have conducted post-disaster research successfully with mail questionnaires (Logue, Hansen, and Struening, 1979; Ollendick and Hoffmann, 1982; Parker, 1979; Fogleman and Parenton, 1959; Baker et al., 1976; Simpson-Housley et al., 1982). Because we were island residents, had shared the hurricane experiences, and wanted the most accurate data possible, we chose to employ a lengthy mail questionnaire. The technique has been judged sound in situations where interest in the subject of a questionnaire is high (Roszkowski and Bean, 1990), the condition on the island after the hurricane.

Identifying the Island Population after Dislocation

Before Hurricane Hugo, the Sullivan's Island Post Office serviced some 450 rural route addresses and 650 post office boxes. In June 1990, deliveries were down to 350 addresses and 500 boxes. To obtain the widest possible coverage, we created a redundant mailing list by adding to the total of 850 rural route deliveries and post office boxes additional addresses drawn from the Sullivan's Island Town Council water-meter account and Charleston County Tax Maps. Nine months after the hurricane, on the first day of the new hurricane season, questionnaires were mailed first class to names and addresses on a final list winnowed down only to the extent of eliminating duplications. At the time of the mailing few residential structures had been completely repaired or replaced on the island, and, according to town officials, fewer than 40% of the island residents were living in their homes. After two weeks, a first-class follow-up letter and questionnaire were mailed to all non-respondents. One or more questionnaires were sent to 950 names, occupant addresses, and street numbers. A post-mailing inventory revealed that, of the 950 mailings, only 876 went to what initially appeared to be valid addresses; of these, 242 questionnaires were returned as undeliverable due to missing forwarding addresses or turned out to be multiple property ownership cases or dual addresses (both a street and a post office box). The number of identifiable island addresses in June, 1990 totaled 634, from which 274 completed questionnaires were returned, providing a response rate of 43.2%.

A one-page cover letter to the questionnaire identified the authors as island residents conducting an academic study under a grant, informed readers that completing the questionnaire would require about 30 minutes of their time, promised confidentiality of individual responses, invited commentary, and asked

if respondents would be willing to participate in follow-up interviews. Sections of the questionnaire addressed residency and property ownership, basic demographics, amounts and type of property damage, insurance coverage, insured and uninsured losses, the length of time and reasons for being out of residence after the storm, public policy issues, and other matters.

Questions and Scales--Stress

The personal safety impact of Hugo was measured by 11 questions regarding the degree of stress felt initially from the impact of the hurricane. Each question was accompanied by five-point Likert-type scales with anchors "extremely" (1) to "barely" (5). Questions included areas of concern arising from initial evacuation warnings to the impossibility of returning to the island because the bridge was down after the hurricane. A 16-item modified version of the Holmes and Rae (1967) Schedule of Recent Experience (SRE), labeled the Social Readjustment Rating Scale (SRRS), was used to assess the impact of the hurricane within the framework of other life events. The questionnaire listed life events and each head of household was requested to check the number experienced. A count of the events listed then was made. This method, where weights are not used for each life event, has been supported as reliable to collect data on the stress-illness correlation of life events (Zimmerman, 1983).

Undesirable life events are directly correlated with stress. This finding is supported in the research of Hutchins and Norris (1989) in a special examination of life change in a disaster recovery period. A shortened life events classification scale was employed here to examine the effects of disruption. Included are household disruption (problems of rebuilding, contractor misrepresentation, dealing with insurance companies, contractors in general, increased demands on time); financial instability (increased debt, lack of income); family conflict (separation and/or divorce); social jarring (no time for fun or social interactions), and bereavement (death of loved one or close friend). Work-related life events, identified by Greenhaus and Beutell (1985) and Greenhaus and Parasuraman (1986), indicate that work and non-work stressors have additive effects. Those used here include job changes, retirement age, training for new job, increase in hours worked, and management changes at work. An open-ended blank was left for each respondent to record other life events not included on the list. To view links between work and non-work, respondents were requested to list absences from work before and after Hugo on an annual basis and the primary reasons for missing work.

The potential intensive impact of stress over time was measured by the 20-item Brownout Inventory (Freudenberger and Richelson, 1980), to which anchors of "extremely" (1) to "barely" (5) or "no change" (0) were used to measure responses. This scale was selected because it appeared in interviews with hurricane victims to bear a closer resemblance to the conditions that the victims faced nine

months after the storm. Because this was an index of change in stress level, a consistency check was employed; data were examined to include only those people who answered at least 20 of the 25 questions asking about increases in specific stress symptoms. This yielded an 80% response rate.

A number of generic questions were used to assess the overall stress level of the respondent. At the completion of this measure, each respondent assessed the degree to which Hugo was a stressor relative to other life experiences. The final open-ended section of the questionnaire addressed the general impact of Hurricane Hugo on the lives of island residents.

Questions and Scales--Insurance

The insurance section of the questionnaire included 20 insurance questions grouped in two instruments, one of 12 items and the other an eight-item instrument. Questions in the eight-item instrument addressed the types and levels of insurance coverage before and after the storm, policyholder concerns over wind and flood damage assessments, the level of satisfaction with the treatment from insurance companies for property and personal effects damages, recommended changes in coverage and insurance mandates, and other items. Experience with insurance representatives in such matters as responsiveness, treatment by adjustors, settlement time, and satisfaction with settlement was measured on a 20-item scale covering specific details on perceived treatment by insurance companies. The five-point Lickert-type scale questions employed anchors "disagree completely" (1) to "agree completely" (5) to gain a perspective of insurance company effectiveness. Respondents who had insurance from two companies completed this section of the questionnaire for each carrier. Related questions elsewhere in the questionnaire asked about property values, the extent of damage to property, losses not covered by insurance, the code of damage assigned to property in a post-storm engineering survey, and the flood zone in which the island resident lived.

FINDINGS--DEMOGRAPHICS, DAMAGE AND LOSS, INSURANCE

Demographic Composition of Respondents

Comparison of survey results with public records shows no statistically significant differences between the pre-storm population of Sullivan's Island and post-hurricane respondents for demographics such as age, sex, race, marital status, and number of people in the household. Comparison also shows no statistically significant differences between averages of the assessed value of property reported by respondent owners and county tax map data. Nor were there any statistically significant differences between the various levels of property damage reported by respondents in categories which lent themselves to comparison with a damage and recovery assessment completed a year after the storm (Berkeley-Charleston-Dorchester Council of Governments, 1990a). The absence of differences suggests that the sample accurately portrays the Sullivan's Island population, with one possible exception. Although the exact number of renters residing on the island before the hurricane cannot be determined (because not all rental units were recorded on town records), the fact that the questionnaire respondents were mainly island property owners (N = 253, 92.3%), year round residents (N = 116, 42.3%), or owners of family vacation or summer homes (N = 65, 23.7%) or rental property (33, 12.0%) suggests that the pre-storm rental population, which was dispersed after the storm, may be slightly underrepresented.

Table 1
SELECTED POPULATION CHARACTERISTICS

		<u>SD</u>	<u>Min</u>	<u>Max</u>	<u>N</u>
Head of Household					
Average Age	53.67 (\bar{X})	14.52	26	97	267
Sex	73.9% male, 26.1% female	.	.	.	.
Race	96.7% white	.	.	.	.
Marital Status					
Married	28.7%	.	.	.	.
Single/Div/Sep/Widowed	71.3%	.	.	.	.
Dual Career Couple	27.7%	.	.	.	.
Family Members in Residence	2.19 (\bar{X})	1.62	0	7	269

Damage and Loss

The degree of property loss and damage on Sullivan's Island varied only in severity. One hundred and nine of those responding to the survey (39.8%) were both primary residents and property

owners on Sullivan's Island and perceived their damages to be high. These islanders had resided on the island for an average of 20 years (SD 20.24, min = 1 and max = 98; N = 255). More than half (61, 56%), had not been able to return to the island six months after the storm because their homes were uninhabitable. The average damage reported was \$88,907 (SD = 97,294), the minimum reported in this group was \$1,001, with a maximum of \$650,000 (N = 242). Overwhelmingly (105, 96.3%), they said the hurricane had upset their lives. Absences from work ranged from four to seven days. Nearly two-thirds (69, 63.3%) described their lives as very or extremely upset, with a relatively high level of apprehension at the outset of the new hurricane season.

Table 2
DAMAGE AND LOSS

Self-Described Level of Damage to Homes	
Minimal Damage	9.6%
Some Damage	29.5%
Severe but Habitable	15.9%
Severe and Uninhabitable	40.2%
Destroyed by the Storm	4.8%
Self-Reported Amounts of Damage to Real Estate	
None	1.8%
Under \$10,000	9.1%
\$10,001-\$40,000	29.6%
\$40,001-\$70,000	19.7%
Over \$70,000	27.1%
Unknown/No Response	12.7%
Self-Reported Amounts of Damage to Property and Possessions other than Real Estate	
None	8.0%
Under \$10,000	39.4%
\$10,001 or more	39.3%
Unknown/No Response	13.3%

Insurance Experiences

Responses to questions about insurance representatives and companies showed wide differences in experience. Nine of every ten people surveyed (246, 89.8%) had wind or homeowners insurance coverage and nearly two-thirds (172, 62.8%) had flood insurance for buildings. But fewer than half (112, 40.9%) had their contents insured against flood damage. Only one policyholder in four (65, 23.7%) said that before the storm they had a full and informative discussion with their insurance agent. More than half (149, 54.41%) said they had no real discussion. Only four policyholders in ten (106, 38.7%) said

they had been fully aware of the costs of flood insurance and the risks of not being insured. Only one policyholder in five (56, 20.1%) said that before the storm their agent or company made them fully aware of the distinction between insurance coverage for loss from wind damage and losses from flood damage. Eighty-two people (29.9%) reported uninsured losses under \$10,000, and 124 (45.3%) uninsured losses from \$10,000 upwards. The average loss was \$18,928 (SD = \$46,116) with a minimum loss of \$0 and a maximum of \$402,000 (N = 242). Table 3 presents more detail.

Table 3
SELF-REPORTED AMOUNTS OF LOSSES NOT COVERED BY INSURANCE

None	16.4%
Under \$10,000	29.9%
\$10,001-\$20,000	16.8%
Over \$20,001	26.7%
Unknown	10.2%

Both prepared and unprepared policyholders ran into difficulties. A majority of people (146, 53.3%) said they had experienced at least two from a list of seven types of problems with their insurance companies. An almost identical percentage (147, 53.6%) checked at least two from a list of seven items describing relative insurance company efficiency/inefficiency. Only a small minority (33, 12.0%) reported at least one of three friendly actions on the part of insurance representatives. Four policyholders in ten (106, 38.7%) said their insurance company was overwhelmed in the first month after the hurricane. Many sorely tried policyholders confronted their companies. A third asserted themselves in at least one of four ways, such as threatening to go over an adjuster's head or reporting the company to the state insurance board (90, 32.8%), and nearly a quarter of this group (63, 23.0%) carried through by taking some action.

Although three claims out of every four were settled within four months after the storm (186, 76.5%), only half the policy holders (120, 46.8%) said they were satisfied or extremely satisfied with their settlements. One policy holder in every four was either neutral (69, 25.2%) about the settlement or dissatisfied to some degree (63, 25.0%). More than one quarter of the people (66, 28.7%) said they would not be compensated for major losses they thought were covered in their policies. A scale constructed from experiences with losses, perceived problems, the need to assert oneself or take actions, and insurance company efficiency and friendliness shows that only one policy holder in four (72, 26.3%) had a relatively good insurance experience. More than half the people (159, 58.0%) reported at least three different types of problems. Nearly one policyholder in six (43, 15.7%) had an insurance

experience that could be described as bad. Better than a third of all policyholders (95, 34.7%) said they had changed insurance companies since the hurricane.

The analyses of the hypotheses for insurance coverage are presently being completed and not part of the present working paper. A number of stress factors which relate to insurance coverage and insurance company treatment are discussed below.

FINDINGS: STRESS

The results are presented under three classifications of stress described above: (1) the personal safety impact of the disaster, (2) change in stress levels, and (3) comparative analysis of the disaster with other major life events.

Personal Safety Stress, Hypothesis 1

The predicted association between the experience with disaster and the enhanced concern for future harmful events is fully supported here in the test of pre/post perceptions of the felt stress impact of the storm. Hypothesis 1, that the perceived stress on initially hearing the warnings to leave the barrier island before Hugo will be less stressful than the perceived stress on first returning to the island post Hugo is supported by the Non Parametric Wilcoxon Test. The concern about leaving the island at the time of evacuation ($\bar{X} = 2.66$, $SD = 1.21$, $N = 197$) significantly differs ($Z = -9.82$, 2-tailed $p < .001$) from the level of concern on first returning after the storm ($\bar{X} = 4.01$, $SD = 1.14$, $N = 258$). Of the 192 matched cases, 140 were more concerned on returning to the island than they were prior to originally leaving before Hugo.

Personal Safety Stress, Hypothesis 2

The hypothesis that concern about living on a barrier island before Hugo will be less than the post-Hugo concern, is also supported by the Wilcoxon Matched-Pairs Signed-Ranked Test. The concern about living on a barrier island before Hugo was relatively low ($\bar{X} = 1.65$, $SD = .92$, $N = 264$). While concern remained somewhat low after the storm ($\bar{X} = 2.39$, $SD = 1.13$, $N = 263$), the difference is significant ($Z = -8.70$, 2-tailed $p < .001$). The level of apprehension about living on a barrier island is more severe for 120 of the residents than it was before the storm.

Personal Safety Stress, Hypothesis 3

The hypothesis that concern for the security of evacuation routes before Hugo would be less than the concern after Hugo, is supported here. While the average level of pre-Hugo concern over evacuation routes is relatively high ($\bar{X} = 3.19$, $SD = 1.36$, $N = 263$), the concern increased after Hugo ($\bar{X} = 4.07$, $SD = 1.16$, $N = 265$) and is significant ($Z = -9.73$, 2-tailed $p < .001$). Here, 136 of the 262 respondents are far more concerned about the current single evacuation route from the island than they were before the storm.

Perceived Change in Stress Levels

Hypotheses regarding perception of change in stress levels were examined for those who had a minimum score of at least 20 out of a maximum potential score of 125 using the criterion of an 80% response rate.

A demographic profile of the 135 participants who indicated change in stress levels post Hugo indicates the average age of the group to be 52 (SD = 14, SE = 1.2). The sample is composed of predominantly male heads of household (97, 72%), mostly single, divorced, or separated (71%), who, on average, missed 8-10 days of work as a result of Hugo. All but 13 had owned property on the island, averaging 17 years, but fewer than half reside on the island as full-time residents.

All who experienced a change in stress level had real or personal property damage. For 63 people, that damage was completely covered by insurance. (Forty-eight of the group had not settled their claims at the time of the survey and did not complete this section of the questionnaire.) Damages kept property owners out of residences for 19 weeks, on average (SD = 17). Forty-five percent of this group had damages totaling less than \$50,000, 24% had damages between \$50,000 and \$100,000, and the remaining 42% had damages exceeding \$100,000. The average damage was \$99,076 (SD = \$107,554), the highest \$650,000, and the lowest \$5,001. Maximum insurance coverage totaled \$330,000. The average uninsured loss was \$18,891, and the maximum not covered by insurance was \$402,000. Some of those who had high damages were not fully insured.

Change in Stress Levels, Hypothesis 1

The hypothesis that the best predictors of the change in stress among island residents would be the amount of damage, absences from work, marital and dual career status, and satisfaction with insurance company treatment, is supported here ($r^2 = .34$, $F = 6.22$, 6/70 df and $p < .0001$). The incremental change in stress among those who are residents or owners on the island appears to be best predicted by absences from work ($b = 5.49$, $p < .002$), satisfaction with insurance company treatment ($b = -3.88$, $p < .03$) marital status ($b = 17.52$, $p < .004$), dual career status ($b = 10.98$, $p < .04$), and damage level ($b = 3.98$, $p < .06$). A variable not significant in predicting a change in stress level is the length of time out of residence due to the storm. This may be in part because only half of this group of residents lived on the island full time and many of the homes were summer or rental residences. An important predictor, absences from work, maintained this analysis at N of 76 because many respondents had retired or did not work outside the home.

When the analysis is not restricted to island residents but left open to property owners or residents, one of the three most important predictors in the change in stress level is damage ($r^2 = .27$, F

= 8.67, 3/71 df, $p < .001$). Another explanation is evident in comparing islanders with and without uninsured losses. The best predictors in the change in stress level for the uninsured loss group (overall $N = 60$) are absences from work, marital status, and dual career status ($r^2 = .35$, $F = 5.94$, 3/32 df, $p < .002$). For the 61 people who had no losses, absences are still a significant predictor, but here the actual level of damage is also important ($r^2 = .31$, $F = 8.43$, 2/38 df, $p < .001$).

Change in Stress Levels, Hypothesis 2

The hypothesis that change in perceived stress of primary residents and property owners is a function of marital and dual career status, length of residence on the island, and satisfaction with insurance company treatment, is supported ($r^2 = .42$, $F = 3.04$, 7/30 df, $p < .02$). However, the change within this group appears to be more a function of dual career status ($b = 19.51$, $p < .01$), satisfaction with the insurance company treatment ($b = -5.65$, $p < .02$), and marital status ($b = 23.38$, $p < .02$), than for all the variables initially proposed.

The suggestion in the literature that older victims of natural disasters would feel greater changes in stress than younger victims was tested by two subsets of the hypothesis. The test for the older group is not supported here, but the sample size is so small that the test may not be adequate. In this test, older was defined as people over the retirement age of 65. The 13 respondents ranged in age from 65 to 79. They had uninsured losses from \$2,500 to \$60,000. Seven considered the level of loss heavy. Only three were dissatisfied with their treatment from insurance companies. All but one considered the storm equal to or much more stressful than other life events. Their levels of apprehension at the beginning of the new hurricane season either resembled that at the time of the initial warnings during the evacuation period or are higher now.

Significant change in stress levels among those under 65 is observed in this study. The hypothesized relationship is supported ($r^2 = .47$, 7/26 df, $p < .01$) for absences from work, marital status, and dual career membership. The total damage to property, insurance coverage, satisfaction with insurance company treatment, and time out of property were not significant predictors of the change in the stress level for this group by age. The variables which explain most of this variance are absences ($b = 5.90$, $p < .01$), satisfaction with insurance company treatment ($b = -4.33$, $p < .05$), marital status ($b = 17.03$, $p < .01$), and dual career couple status ($b = 10.80$, $p < .11$). Uninsured loss, time out of residence, and the level of damage were not significant predictors of the change in stress when the above variables are accounted for. The group ranges in age from 33 to 64 ($\bar{X} = 48$, $SD = 8.41$), includes 41 property owners, 18 of whom had their primary residence on the island, and who, on average, had owned their property for more than 14 years. Their damage ranged from \$9,200 to \$650,000 ($\bar{X} = \$131,676$,

SD = \$152,120). Average uninsured loss in the group was \$45,698 (SD = \$78,299) and went as high as \$401,999. The time out of residence averaged 20 weeks (SD = 18). More than half this group had increased debt, problems with rebuilding, and difficulty dealing with insurance companies. The single largest constraint they listed was pressure on their time. Seventy percent found the impact of the hurricane equal to or more severe than other life events they had encountered ($\bar{X} = 3.85$, SD = 1.10), and 73% felt more apprehensive ($\bar{X} = 3.63$, SD = .73) at the beginning of the new hurricane season than they had on hearing the initial evacuation warnings to leave the island before Hugo. Among those who did not have a loss and who were under age 65 and were owners of property on the island or primary residents, the most important predictors of the change in stress level were the number of absences from work and the level of damage ($r^2 = .27$, $F = 6.45$, 2/34 df, $p < .01$). This group of 48 individuals had damage ranging from \$5,000 to \$306,000.

Because uninsured loss and the amount of damage were expected to be predictors of changes in stress, some post hoc analyses were run by residency status and damage to examine the loss impact. The results are provided below.

Property Losses and Insurance Coverage

When one breaks this analysis out by the degree of loss or insured damage, the following appears: of the 59 island dwellers who owned property or lived on the island at the time of the storm who either did not suffer a monetary loss or had complete insurance coverage, the best predictor of the level of stress is the number of absences from work and the degree of damage. While this subgroup had no uninsured loss, there was a significant change in the level of perceived stress ($r^2 = .30$, $F = 7.40$, 2/36 df, $p < .002$). The average age in the group was higher ($\bar{X} = 52$, SD = 14.35) than that for people not in the subgroup. Heads of household were predominantly male (46 or 78%, as contrasted with 13 females, 22%), single (44, 75%), thus not part of a dual career couple (39, 66%), and had lived on the island for 15 years ($\bar{X} = 16$, SD = 18). On average, the members of this subgroup were out of residence for 18 weeks (SD = 17, SE = 2.23). They expressed a relatively high level of satisfaction with their insurance companies ($\bar{X} = 3.36$, SD = 1.31).

For another subgroup, composed of 25 resident property owners who had no uninsured loss, the relationship between the proposed variables and the change in stress is not significant within the acceptable cutoff level used throughout this study ($r^2 = .69$, $F=2.86$ 7/9 DF, $\alpha = .07$). Within the group of variables, the best two predictors are level of damage ($b = 1.70 < .05$) and marital status ($b = 36.13$, < 0.05). The average amount of damage among these property owners was \$108,465 (SD = \$16,100). A clear majority of these respondents were single, divorced, or separated (N = 19). On average, they had

lived 15 years on the island (SD 21.15). Most were men (22 of 25). Their average time out-of-residence was 15 weeks (SD = 16.50). Generally, they were satisfied with the treatment they had received from the insurance companies ($\bar{X} = 3.28$, SD = 1.34, SE = .27).

Results differ slightly in another subgroup of 21 non-resident property owners in the high age group who did not have uninsured losses. Here absences from work to take care of property ($b = 10.26 < .04$) and level of damage ($b = 1.67 < .04$) were the best predictors of the change in the stress level. The average age of this group was 60 (SD = 14.95), and the majority were single (15). Only one was a member of a dual career couple. They had owned property on the island for an average of 20 years (SD = 18). Average damage was \$76,262 (SD = \$73,438.59). They generally were satisfied with their insurance company treatment ($\bar{X} = 3.0$, SD = 1.38, SE = .31).

Uninsured Losses

Uninsured losses had a significant impact on those who owned property on the island whether they were primary residents or not. In this group, changes in stress scores were high, ranging from 20 to 113. The nature of the change in stress is clearly indicated by the average score of 53.24 (SD = 22.18 and SE = 2.99) for the 55 property owners, of whom 23 were primary residents. Changes in the stress level ($r^2 = .34$, $F = 5.29$, 3/31 df, $p < .005$) relate to absences from work, averaging 8-10 days ($b = 6.74$, $p = .01$), marital status ($b = 25.80$, $p < .01$), and membership in a dual career couple ($N = 14$) ($b = 18.33$, $p < .03$). The average age is 53, with ranges up from a minimum of 33. Males were heads of household in 66% of the group. The damage in this group ranged from a high of \$650,000 to a low of \$5,001, with an average damage of \$117,366. Members in this group had lived on the island longer ($\bar{X} = 17$, SD = 17, SE = 2.34) and had on average an uninsured loss of \$38,098 (SD = \$66,054, SE = \$8527). In this group, there was much dissatisfaction with the insurance company treatment and less satisfaction with town management after the hurricane.

Age and Loss

The factors of age and loss together had slight effect. Thirteen Sullivan's island property owners were primary residents, members of the high age group, and had losses which were not covered fully by insurance. The sustained damage of this group ranged from \$5,000 to \$165,000 ($\bar{X} = \$75,493$, SD = \$58,012). The highest uninsured loss among the group was \$60,000 and the minimum loss was \$2,500, with an average loss of \$21,866. There was more dissatisfaction in this group with the insurance company treatment, but the change in stress level was not significant (.06, not within the .05 level). Among the 28 property owners who were not primary residents on Sullivan's Island who had uninsured

property damage, the relationship between the expected variables and the increase in stress also was not significant. This may be largely attributed to the small number of respondents in this category.

Life Events Hypotheses

These examined previous findings that suggest the onset of a new hurricane season would escalate the feeling of stress. The average number of life events checked was 3.80 (SD = 2.63, min = 0 and max = 14). Table 4 presents a composite analysis across all island residents.

Table 4
DEMOGRAPHIC DATA BY ENTIRE GROUP FOR LIFE EVENTS

Variable	Value	Frequency	Valid Percent	Cum Percent	Percent
Sullivan's Island Property Owner	1	230	92.0	92.0	100.0
Sullivan's Island Primary Residence	1	103	41.2	41.2	100.0
Head House Sex					
MALE	0	185	74.0	74.3	74.3
FEMALE	1	64	25.6	25.7	100.0
Marital Status					
SIN/DIV/SEP	0	176	70.4	70.7	70.7
MARRIED	1	73	29.2	29.3	100.0
Loss Not Covered by Insurance					
All covered		112			50.2
500 - 50,000		93			41.3
54,998 - 90,000		10			4.1
107,000 - 402,000		9			3.6
Perception of Level of Damage					
Low	1	116	46.4	46.4	46.4
Moderate	2	60	24.0	24.0	70.4
High	3	74	29.6	29.6	100.0

The analysis of the hypotheses is based on the 199 respondents with life event scores greater than zero and low, moderate, or high property damage.

Hypothesis 1. This hypothesis anticipated that the Hugo impact would be considered more stressful than other life events dependent upon the level of damage (low, moderate, and high), and that household disruptions (i.e., problems of rebuilding, contractor misrepresentation, dealing with insurance companies, contractors in general, increased demands on time), would be the most frequently cited cause.

The hypothesis is supported here by the non-parametric Kruskal-Wallis test. This one-way analysis of variance (Chi-Square = 5.76, $p < .05$, $N = 185$) supports the hypothesis that, based on the level of damage, respondents viewed the Hugo impact associated with household disruptions as more severe than other life events (Table 5).

Table 5
HUGO DAMAGE IMPACT OF REBUILDING AS MAJOR LIFE EVENT STRESSOR

<u>Level of Damage</u>	<u>Mean Rank</u>	<u>Cases</u>
1	98.78	77
2	77.52	47
3	97.63	61

Kruskal-Wallis 1-Way Anova

Chi-Square 5.7611

Significance .05

Note: 185 of the 199 respondents listed household disruptions as a major life event.

Specifically, respondents with low and high levels of damage rated the impact of Hugo as more stressful. In the three classifications of damage, low, moderate, and high, the actual dollar amounts of damage ranged across a wide spectrum, as Table 6 shows.

Individual perceptions of damage suffered did not necessarily match the dollar damage in terms of severity (Table 7). In Group 1 (low damage), composed of 84 respondents, for example, only 11 (13.1%) rated their damage as minimal, while 32 (38.1%) rated themselves as having higher levels of damage. Others rated damage to their homes as severe or destroyed. In this same group, 14 (16.7%) rated damage to their homes as severe but habitable, 24 (28.6%) as severe and uninhabitable, and two listed their property as totally destroyed (2.4%). In the moderate damage group, no one considered his or her damage minimal, while 72% rated their property as severely damaged or destroyed. In the high damage group, one person considered the damage minimal while 58 (89.1%) said damage was severe or their property was destroyed. One sees an escalation in the percentage of respondents who judged their damage as heavy (Group 1, 47.6%; Group 2, 72.0%; Group 3, 89.2%) irrespective of the dollar values of the losses. Time out of residence corresponds to damage levels. In the low damage group, 46% had been out of their residences for more than a month. The figure is similar for the moderate damage group. Nearly nine out of ten (86%) of those with severe household damages were put out of their residences, and many were still out nine months after the storm. Differences appear in the percentages of damage covered by

insurance. In Groups 1 and 3, 31% and 46% of the respondents had their damages completely covered by insurance. In Group 2, 60% of the respondents were covered.

Table 6
DAMAGES AND INSURANCE COVERAGE FOR EACH LEVEL OF DAMAGE

		Group 1--Low Damage			
		Property, Contents, and Uninsured Damage		Amt Damage Not Covered by Insurance	
<u>Property/Content Damage</u>					
				All Covered	26 31.0%
\$ 2,500 - 50,000	61	72.6	\$ 500 - 50,000	35	41.6
54,998 - 90,000	0	0.0	54,998 - 90,000	0	0.0
107,000 - 402,000	0	0.0	107,000 - 402,000	0	0.0
Missing Data	23	27.4		23	27.4

		Group 2--Moderate Damage			
		Property, Contents, and Uninsured Damage		Amt Damage Not Covered by Insurance	
<u>Property/Content Damage</u>					
				All Covered	30 60.0%
\$ 2,500 - 50,000	0	0.0	\$ 2,000 - 40,000	15	30.0
50,000+- 95,000	50	100.0	54,998 - 79,000	5	10.0
107,000- 402,000	0	0.0	107,000 - 402,000	0	0.0

		Group 3--High Damage			
		Property, Contents, and Uninsured Damage		Amt Damage Not Covered by Insurance	
<u>Property/Content Damage</u>					
				All Covered	30 46.2%
\$ 2,500 - 50,000	0	00.0	\$ 5,000 - 50,000	23	35.3
54,998 - 90,000	0	00.0	54,998 - 90,000	4	6.2
100,000 - 650,000	65	100.0	107,000 - 402,000	8	12.3

Close analysis of the composition of these groups isolates the importance of several variables. The average damage across all groups (Table 8) on both contents and property is \$88,907 with a SD over \$97,293.95. Minimum damage is \$1,001 and maximum \$650,000. The average uninsured loss is relatively low, \$18,927.77, with a SD of \$46,116 and a minimum actual uninsured loss of zero. The low level of uninsured loss may explain the relatively high satisfaction with insurance company treatment nearly nine months after the storm ($\bar{X} = 3.35$, $SD = 1.25$, $N = 252$). The average number of life event stressors checked was 3.80 ($SD = 2.63$) with a minimum of one and a maximum of 14 for 199 respondents. Of those clearly indicating life events as stressors, almost half were attributed to household

Table 7
COMPARATIVE DEMOGRAPHIC ANALYSIS OF GROUPS BY DAMAGE

Variable	Value	Group 1 Damage		Group 2 Damage		Group 3 Damage	
		Freq.	%	Freq.	%	Freq.	%
Sullivan's Island							
Property Owner	no	14	16.7	01	2.0	01	1.5
	yes	70	83.3	49	98.0	64	98.5
Sullivan's Island							
Primary Residence	no	51	60.7	28	56.0	37	56.9
	yes	33	39.3	22	44.0	28	43.1
Head House Sex							
Male	0	61	72.6	37	74.0	54	83.1
Female	1	23	27.4	12	24.0	11	16.9
Missing				1	2.0		
Marital Status							
Sin/Div/Sep	0	57	67.9	39	78.0	51	78.5
Married	1	26	31.0	11	22.0	14	21.5
Missing		1	1.2				
Stress from Hugo Compared to Life Event (LE) Stress							
Much less	1	1	1.2	8	16.0	1	1.5
Less	2	7	8.3	4	8.0	7	10.8
Equal	3	27	32.1	14	28.0	20	30.8
More	4	12	14.3	11	22.0	9	13.8
Much More	5	30	35.7	10	20.0	24	36.9
Missing	9	7	8.3	3	6.0	4	6.2
% of LE Represented by Household Disruptions							
Less than .33		27	32.1	8	16.0	16	24.6
Less than .66		34	40.5	21	42.0	25	28.5
More than .66 to 1.00		23	27.4	21	42.0	4	6.2
Stress							
Lower Stress	1	4	4.8	0	0.0	2	4.1
No Worries	2	4	4.8	5	10.0	3	4.6
Same Stress	3	16	19.0	13	26.0	20	30.8
Higher Stress	4	52	61.9	30	60.0	09	3.8
Missing	9	8	9.5	2	4.0	24	36.9
Brownout Attributed to Hugo							
No Change/Low Level <14		23	27.4	24	48.0	30	46.2
Moderate Change <50		35	41.6	10	20.0	12	18.4
High Change <97		26	31.0	16	30.0	23	35.4
Age Ranges							
26 to 65		63	74.4	39	77.6	54	82.9
65>		21	23.2	09	20.4	11	14.1
Missing		2	2.4	2	2.0	1	1.5
Absences from Work							
none		14	16.7	14	28.0	13	20.0
1-3 days		16	19.0	02	4.0	1	9.0
4-7 days		11	13.1	7	14.0	5	7.7
8-10 days		13	15.5	10	20.2	15	23.1
10>		4	4.8	1	2.0	9	13.8
Missing		26	31.0	16	32.0	14	21.5
Time Out of Residence							
1 to 4 weeks		44	51.3	21	42.0	09	13.8
Longer/Not Returned		38	46.3	29	48.0	56	86.2
Damage Assessment of Property							
Minimal		11	13.1	0	00.0	1	1.5
Some		32	38.1	14	28.0	5	7.7
Sev/Habitable		14	16.7	14	28.0	9	13.8
Sev/Uninhabitable		24	28.6	20	40.0	40	61.5
Destroyed		2	2.4	2	4.0	9	13.8
Missing		1	1.2	0	00.0	1	1.5
Heavy Damage vs Other							
Other		44	52.4	14	28.0	7	10.8
Heavy		40	47.6	36	72.0	58	89.2

disruptions. Hurricane Hugo was considered on average ($\bar{X} = 3.45$, $SD = 1.30$, $N = 247$) as more stressful than other life events. While respondents appeared to be more upset when they first heard about the storm ($\bar{X} = 3.73$, $SD = 1.18$, $N = 263$) than they were nearly nine months later at the beginning of the new hurricane season ($\bar{X} = 3.47$, $SD = .75$, $N = 247$), the means are relatively high, indicating high stress levels in both the pre- and post-Hugo periods.

Table 8
DAMAGES AND VARIABLES ACROSS ALL GROUPS

Variable	Mean	Valid		Max	N
		SD	Min		
Damage	88,908	97,294	1,001	650,000	242
Uninsured Loss	18,927	46,116	0	40,200	242
Life Events Checked	3.80	2.63	0	14	274
Hugo as Compared to Other LE	3.45	1.30	1	5	247
Apprehension	3.47	.75	1	4	247
Degree Hugo Upset Life	3.73	1.18	1	5	263
Change in Stress	28.64	27.66	0	113	274
Head of Household Age	53.67	14.52	26	97	267
Family Members in Residence	2.19	1.62	0	7	269
Absences from Work due to Hugo	1.54	1.35	0	4	193
Satisfaction with Insurance Co.	3.35	1.25	1	5	252
Length of Time Out of Residence	19.32	17.76	0	50	268
Length of Time Living on SI	20.11	20.24	1	98	255
Perception of Damage	3.01	1.13	1	5	271
Degree of Damage	.60	.49	0	1	274

Number of valid observations (listwise) = 99.00

All scales and coding devices for the interpretation of this and other tables are available from the authors.

Table 9 profiles respondents by level of damage. In the entire sample, the grand mean for damage was \$88,907 and the standard deviation is high, indicating a great deal of variance among respondents. Significant differences in losses appear when respondents are grouped according to low, moderate, and high levels of damage and loss. Respondents were grouped by the dollar amounts of loss and damage as follows: Group 1, losses to \$49,000; Group 2, \$50,000 to \$95,000; and Group 3, over \$95,000. In Group 1, the low level of damage is capped off just below \$49,000, yet the average damage is \$27,204. In Group 2, the cap is just under \$95,000 and the average \$69,166. For Group 3, the cap is \$650,000 and the mean nearly \$199,230. Dollar amounts of uninsured losses rise in similar fashion: \$9,347 in Group 1; \$12,589 in Group 2, and \$41,736 in Group 3.

Although a number of variables remain relatively the same across groups, i.e., number of life events checked, percentage of household disruptions, age of head of household, the number of family

Table 9
DAMAGE BY GROUP AND AVERAGE RESPONSES ACROSS VARIABLES

Variable	Group 1 -- Low Damage					Group 2 -- Mod. Damage					Group 3 -- High Damage				
	Mean	SD	Min	Max	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max	N
Damage	27204	13197	2500	49000	61	166.06	12520	50000	95000	50	199230	124638	100000	650000	65
Uninsured Loss	9347	11982	.00	44000	61	589.98	20776	.00	79000	50	41736	79422	.00	402000	65
Life Events Checked	4.64	2.23	1.00	14.00	84	4.60	2.44	1.00	12.00	50	5.06	2.45	1.00	12.00	65
Hugo as Compared to Other LE	3.82	1.10	1	5	77	3.23	1.35	1	5	47	3.79	1.14	1	5	61
Apprehension	3.53	.82	1	4	76	3.52	.68	2	4	48	3.51	.73	1	4	65
Degree Hugo Upset Life	3.79	1.02	1	5	82	3.80	1.18	1	5	50	4.36	.84	2	5	64
Change in Stress	35.25	26.58	.00	97.00	84	27.02	24.54	.00	88.00	50	38.06	32.61	.00	113.00	65
Head of Household Age	53.80	15.66	26	97	82	52.39	14.69	26	82	49	53.06	11.90	33	77	64
Family Members in Residence	2.20	1.49	0	6	82	2.31	1.31	0	5	49	2.45	1.87	0	7	65
Absences from Work due to Hugo	1.60	1.27	0	4	58	1.47	1.38	0	4	34	1.96	1.50	0	4	51
Satisfaction with Insurance Co.	3.36	1.14	1	5	72	2.89	1.25	1	5	46	3.05	1.41	1	5	65
Length of Time Out of Residence	14.73	17.45	1	50	82	21.32	18.65	0	50	50	4.26	4.15	0	15	65
Length of Time Living on SI	19.92	19.11	1	98	77	19.13	18.87	1	66	47	19.40	20.65	1	98	62
Perception of Damage	2.69	1.10	1	5	83	3.20	.90	2	5	50	3.80	.84	1	5	64
Degree of Damage	.48	.50	.00	1.00	84	.72	.45	.00	1.00	50	.89	.31	.00	1.00	65

members in the residence at the time of the storm, the length of time in residence on the island and the feeling about the necessity of martial law, there are a number of important significant differences among the groups. Those in the moderate damage group rated the impact of Hurricane Hugo as compared to other life events as less stressful than did those in the lower and higher damage groups. Those with heavy damages and high levels of uninsured losses are more upset than other groups (Group 1 $\bar{X} = 3.79$, $SD = 1.02$; Group 2 $\bar{X} = 3.80$, $SD = 1.18$; and Group 3 $\bar{X} = 4.36$, $SD = .84$). The amount of change in stress attributed to the storm, and the length of time out of residence are factors here. This group also has more negative feelings with regard to their treatment by the town after the hurricane.

Hypothesis 2. This hypothesis, that there will not be a significant difference in the ratings of Hurricane Hugo as more stressful than other life events by age, was not supported. However, as the number of respondents in this group was low, this result may be more attributable to the small number than a lack of differences by age. When other life events were tested by classification, as suggested in the literature, there were no significant differences by damage level or age. Criteria included the test of financial life events (increased debt, lack of income), family conflict events (separation and/or divorce), social events (no time for fun or social interactions), bereavement (death of loved one or close friend), and work-related categories identified in other research (Greenhaus and Beutell, 1985; Greenhaus and Parasuraman 1986).

Hypothesis 3. This hypothesis, that Hurricane Hugo would be more stressful for those with a high level of damage than other life events, is confirmed. This was true for people in both the high and low dollar loss groups. In the lower-damage group, dollar damages ranged from \$2,500 to \$50,000. While 31% had all their damage covered, 42% had a loss ranging from \$500 to \$44,000. (The missing 27% may be attributed to insurance claims still not settled at the time of the survey). In the high damage group, dollar damages ranged from \$100,000 to \$650,000, while 46% had all damages covered, 35% had uninsured damages from \$5,000 to \$50,000, and another 19% had uncovered damages from \$54,998 to \$402,000.

Hypothesis 4. This hypothesis, that the greater the number of life events the greater will be the impact of Hugo as a stressor compared to other life events, was confirmed. This was tested using Spearman's Rank Correlation Coefficient. For the group overall, the relationship between the number of life event scores checked ($\bar{X} = 3.80$, $SD = 2.63$ with a minimum of one checked and a maximum of 14) and the assignment of the hurricane as a major life event stressor is ($\bar{X} = 3.45$, $SD 1.30$, $Min. = 1$ and $Max = 5$) $r = .23$, $p < .001$, $N = 250$. Forty-four percent of the life events checked were within the classification of household disruptions (i.e., problems of rebuilding, contractor misrepresentation, dealing with insurance companies, dealing with contractors, and increased demands on time). These are

significantly related to rating the hurricane as more stressful than other life events. Of the two classifications, work-related events ($r = .19, p < .01, N=201$) account for slightly more of the variance than do household disruptions ($r = .11, p < .04$). The next highest allocation of life events was personal and included 25% of the total life events listed. These were negatively related to the hurricane as a major life stressor ($r = -.13, p = .03, N = 229$). Work-related life events were listed by 20% of the respondents. The least listed category of life events related to finances; it made up 11%. Neither work-related nor financial stressors were significantly related to the increased stress due to the hurricane over other life events. The index of change in stress ($r^2 = .45, p < .001, N = 229$) is significantly associated with the rating of life events in general and the consideration of the hurricane as a major life event.

Within-Group Analysis

Within-group analyses yield additional information. In Group 1, average damage \$27,204, minimum damage \$2,500, and maximum damage \$49,000 ($SD = \$13197, N = 61$), increased stress is best predicted by the number of absences from work, the amount of the actual damage, and how upset people felt when they initially heard about the storm ($r^2 = .53, F = 13.80, 3/37$ df, $p = .0001$).

The Spearman's Rank Correlation Coefficient for the relationship between the number of life event scores checked (4.64, $SD = 2.23$ with a minimum of one checked and a maximum of 14; $N = 84$) and the assignment of the hurricane as a major life event stressor is ($\bar{X} = 3.82, SD 1.10, Min. = 1$ and $Max = 5$) $r = .26, p < .01, N = 77$. Thirty-eight percent of the life events checked were within the classification of household disruptions (i.e., problems of rebuilding, contractor misrepresentation, dealing with insurance companies, contractors in general, increased demands on time). There is a high index of relationship ($r = .46, p < .001, N = 116$) of life events and the change in stress level attributed to the hurricane. The same occurs in the perception of the hurricane as a major life stressor as compared to other life events ($\bar{X} = 3.55, SD 1.30, N = 104$) and the Change in Stress Score attributed to the hurricane (Totscore = 29.64, $SD = 27, N = 116$) $r = .48, p < .001, N = 104$.

There is a high index of relationship ($r = .46, p = .0001, N = 116$) of life events experienced and the change in stress level attributed to the hurricane and especially as compared to the perception of the hurricane with all other life events ($r = .48, p = .0001, N = 104$). A more in-depth analysis indicates important predictors for the change in stress level (among those with $LE > 0$ and who had minimal damage) are the consideration of Hugo as a major life event, the change in work-related events, the number of absences from work, and family members in residence ($r^2 = .50, F = 10.84, 4/44$ df, $p < .0001$).

In Group 2, average damage of \$68,914, with a minimum damage of \$50,000 and a maximum damage of \$95,000 (SD = \$12658, N = 60), and an average uninsured loss of \$14,220, stress change related to how upset respondents were when they first heard about the storm and the return of apprehension at the beginning of the new hurricane season ($r^2 = .38$, $F = 8.83$, $2/32$ df, $p = .001$).

Spearman's Rank Correlation Coefficient for the relationship between the number of life event scores checked ($\bar{X} = 4.10$, SD = 2.51 with a minimum of one checked and a maximum of 12) and the assignment of the hurricane as a major life event stressor is ($\bar{X} = 3.20$, SD 1.29, Min. = 1 and Max = 5). The relationship between these two scores is not significant. And while an average 52% of the life events checked were within the classification of household disruptions (i.e., problems of rebuilding, etc.), these were not significantly related to the number of life events checked. Financial score is significantly related to the overall life event category ($r = .38$, $p < .001$, N = 60). The change in stress score ($\bar{X} = 25.58$, SD = 24.08) is significantly correlated with the life event score ($r = .36$, $p = .002$, n = 60). The rating of Hurricane Hugo as a major life event stressor surpasses other types of life events ($r = .35$, $p = .001$, N = 60).

In Group 3, average damage of \$190,878 with a minimum damage of \$100,000 and a maximum damage of \$650,000 (SD = \$119,119, N = 74), stress change is best predicted by the life event score, the rating of the hurricane as a greater life stressor than other life events encountered, financial losses, and absences from work due to the storm ($r = .54$, $F = 14.04$, $4/48$ df, $p = .0001$). Spearman's Rank Correlation Coefficient for the relationship between the number of life event scores checked ($\bar{X} = 4.61$, SD = 2.61 with a minimum of one checked and a maximum of 12) and the assignment of the hurricane as a major life event stressor is ($\bar{X} = 3.64$, SD 1.19, Min. = 1 and Max = 5) $r = .22$, $p < .03$, N = 69. Forty-eight percent of the life events checked were within the classification of household disruptions. This is the only set of life events significantly related to the Life Event Score ($r = .21$, $p = .03$, N = 74). The change in stress score has a high index of relationship ($r = .49$, $p < .001$, N = 74) with the number of life events checked as well as with the consideration of the hurricane as a major life stressor compared to other life events ($r = .47$, $p < .001$, N = 69).

FINDINGS: GOVERNMENT ACTIONS

Respondents were asked two sets of five questions about their feelings regarding the restrictions on access to the island that were imposed after the storm.

- Q1. (At the time/In retrospect), (I felt/feel) that martial law² was a necessary precautionary measure.
- Q2. (At the time/In retrospect), (I felt/feel) that martial law was necessary in order to get cost-of-living expenses during the evacuation phase from the island.
- Q3. (At the time/In retrospect), (I felt/feel) that martial law interfered with my personal rights to return and examine damage to my property.
- Q4. (At the time/In retrospect), (I felt/feel) a sense of anger and frustration that martial law kept me away from making the necessary repairs to my property.
- Q5. (At the time/In retrospect), (I felt/feel) a sense of resentment toward the town for the absence of more citizen voice in decisions impacting our lives immediately after the hurricane.

Paired sample T-Tests show no statistically significant differences between the initial and retrospective responses for any of the five questions about the restrictions imposed on residents and property. Paired sample T-tests did show statistically significant differences at the .001 level or better between those respondents who completely agreed and those who completely disagreed on each of the ten questions. The pronounced differences were consistent across all groups. Table 10 presents the frequencies for five questions.

As Table 10 indicates, in the entire sample slightly more half the respondents (136, 54.6%) felt bringing in the national guard was a necessary measure; one third (82, 32.9%) did not. More than half (134, 55.1%) said that the use of the guard to keep residents off the island interfered with their rights to return and examine property damage. Slightly over half (125, 51.2%) were frustrated by the fact that they were prohibited from returning after the storm. Many were quite angry, with just under half (110, 46.2%) reporting some measure of resentment toward the town for not letting citizens have more voice in decisions impacting their lives. Paired sample T-tests showed no statistically significant differences among respondents for the other groups. Reactions to the decisions which had kept islanders from returning

²As noted above, there never has been a declaration of martial law after a natural disaster in the United States. However, because national guard and federal troops are present on the scene, the term gains common usage during crises. After Hugo, for example, radio and television broadcasts regularly described the barrier islands as being under martial law. The shorthand term was carried over in the questionnaire because everyone knew exactly what it meant.

Table 10
RESPONSES TO QUESTIONS ABOUT GOVERNMENT ACTIONS

	Entire Sample		SI Property Owners		SI Primary Residence		SI Property Owner, Primary Residence	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. At the time, I felt that martial law was a necessary precautionary measure.								
COMPLETELY DISAGREE	68	27.3	61	26.8	36	33.0	35	34.3
DISAGREE	14	5.6	13	5.7	10	9.2	10	9.8
NEUTRAL	31	12.4	28	12.3	11	10.1	10	9.8
AGREE	23	9.2	21	9.2	9	8.3	8	7.8
COMPLETELY AGREE	113	45.4	105	46.1	43	39.4	39	38.2
Total	249	100.0	228	100.0	109	100.0	102	100.0
2. At the time, I felt that martial law was necessary in order to get cost-of-living expenses during the evacuation phase from the island.								
COMPLETELY DISAGREE	106	51.2	97	51.1	49	51.0	47	52.2
DISAGREE	5	2.4	5	2.6	3	3.1	3	3.3
NEUTRAL	72	34.8	67	35.3	31	32.3	28	31.1
AGREE	6	2.9	6	3.2	2	2.1	2	2.2
COMPLETELY AGREE	18	8.7	15	7.9	11	11.5	10	11.1
Total	207	100.0	190	100.0	96	100.0	90	100.0
3. At the time, I felt that martial law interfered with my personal rights to return and examine damage to my property.								
COMPLETELY DISAGREE	56	23.0	51	23.0	23	21.3	22	21.8
DISAGREE	10	4.1	9	4.1	3	2.8	2	2.0
NEUTRAL	43	17.7	40	18.0	19	17.6	17	16.8
AGREE	18	7.4	17	7.7	7	6.5	7	6.9
COMPLETELY AGREE	116	47.7	105	47.3	56	41.9	53	52.5
Total	243	100.0	222	100.0	108	100.0	101	100.0
4. At the time, I felt a sense of anger and frustration that martial law kept me away from making the necessary repairs to my property.								
COMPLETELY DISAGREE	56	23.0	53	23.8	17	15.6	27	16.7
DISAGREE	12	4.9	10	4.5	4	3.7	3	2.9
NEUTRAL	51	20.9	47	21.1	24	22.0	22	21.6
AGREE	19	7.8	18	8.1	11	10.1	11	10.8
COMPLETELY AGREE	106	43.4	95	42.6	53	48.6	49	48.0
Total	244	100.0	223	100.0	109	100.0	102	100.0
5. At the time, I felt a sense of resentment toward the town for the absence of more citizen voice in decisions impacting our lives immediately after the hurricane.								
COMPLETELY DISAGREE	64	26.9	60	27.6	22	20.2	22	21.6
DISAGREE	10	4.2	9	4.1	5	4.6	4	3.9
NEUTRAL	54	22.7	49	22.6	26	23.9	23	22.5
AGREE	20	8.4	18	8.3	9	8.3	9	8.8
COMPLETELY AGREE	90	37.8	81	37.3	47	43.1	44	43.1
Total	238	100.0	217	100.0	109	100.0	102	100.0

immediately after the storm thus suggest a polarized population. Examples include the numbers of people completely agreeing (N = 113, 45.4%) versus completely disagreeing (N = 68, 27.3%) that keeping people off the island after the storm had been necessary; completely agreeing (N = 106, 43.4%) versus completely disagreeing (N = 56, 23.0%) that the decision to bar access had prevented people from making necessary repairs to the property; and completely agreeing (N = 90, 37.8%) versus completely disagreeing (N = 64, 26.9%) that feelings of resentment toward the township authorities for the decisions still persisted.

Stability in the initial and retrospective responses is indicated for all five questions as no statistically significant differences were found with the paired t-tests. Examination of differences within the response set indicates statistically significant differences (t-tests $p < .01$) in the polarized responses of those who completely agreed and those who completely disagreed on each of the ten questions.

Table 11 presents the results of a set of more intensive stepwise multiple regression analyses examining three groups of respondents: all who participated in the survey, Sullivan's Island property owners, and respondents whose primary residence was on the island.

In Group 1, all respondents to the questionnaire, the polarized effect of the responses is present in two sets of relationships which depict the feelings of Sullivan's Islanders with regard to the proclamation of "martial law." The heaviest sector of the polarization is in the negative direction, as indicated by the high level of variance explained in the relationships of interference with rights and prevention of the necessary repairs. There was a strong feeling that the necessary repairs were prevented ($r^2 = .66$, $F = 157.24$, $2/160$, $p < .001$), and as a result there was anger toward the town ($b = .35$, $p < .001$) and a feeling that personal rights had been violated ($b = .52$, $p < .001$). Another strong indication of the prevalent feeling of islanders was with regard to personal rights ($r^2 = .63$, $F = 89.37$, $3/159$ df, $p < .001$). Here the best predictors were prevention of necessary repairs ($b = .59$, $p < .001$), stress surfacing in household disruptions (as described above in stress section of paper) ($b = .34$, $p < .05$), and anger toward the town ($b = .25$, $p < .001$).

The second part of the polarized response explains less of the variance. The feeling was that martial law was a necessary precaution ($r^2 = .41$, $F = 36.43$, $3/159$ df, $p < .001$). Anger toward the town had a negative relationship ($b = -.52$, $p < .001$). A positive relationship existed in thinking that martial law was a necessary precaution in order to acquire the cost of living coverage from the insurance companies ($b = .33$, $p < .001$). Feelings on the necessity of martial law were negatively related to the number of members living in the household ($b = -.17$, $p < .05$). Feelings that martial law was necessary to gain the cost of living ($r^2 = .20$, $F = 13.35$, $3/159$ df, $p < .05$) explains relatively little of the variance, however, though there is a relationship here to the number of life events, age, and the feeling

Table 11
RESULTS OF MULTIPLE REGRESSION ANALYSES ON POLARIZED RESPONSES

All Respondent Answers as a Group

	Betas										F	DF
	R2	MLNEC	MLRES	MLCOL	MLPNR	FMRES	MLINT	LESORE	HSCORE	HHA		
Marital Law was:												
Necessary Precaution	.41***	----	-.52***	.33***	----	-.17*	----	----	----	----	36.43***	3/159
Essential for Living Cost	.20*	.28***	----	----	----	----	----	.07*	----	.02*	13.35***	3/159
Interfered with Rights	.63***	----	.25***	----	.59***	----	----	----	.34*	----	89.37***	3/159
Prevented Nec. Repair	.66***	----	.35***	----	----	----	.52***	----	----	----	157.24***	2/160

Property Owners on Sullivan's Island

	Betas										F	DF
	R2	MLNEC	MLRES	MLCOL	MLPNR	FMRES	MLINT	LESORE	HSCORE	HHA		
Marital Law was:												
Necessary Precaution	.40***	----	-.54***	.30**	----	-.16*	----	----	----	----	33.78***	3/150
Essential for Living Cost	.19*	.25***	----	----	----	----	----	.08*	----	.02*	11.65***	3/150
Interfered with Rights	.66***	----	.25***	----	.60***	----	----	----	.36*	----	97.58***	3/151
Prevented Nec. Repair	.67***	----	.31***	----	----	----	.57	----	----	----	155.59***	2/151
Anger Toward Town	.61***	-.27***	----	----	.35***	----	.21	----	----	-.02*	58.83***	4/149

Primary Resident of Sullivan's Island

	Betas										F	DF
	R2	MLNEC	MLRES	MLCOL	MLPNR	FMRES	MLINT	LESORE	HSCORE	HHA		
Marital Law was:												
Necessary Precaution	.42***	----	-.73***	.37**	----	----	----	----	----	-.03*	17.60***	3/74
Essential for Living Cost	.22***	.28***	----	----	----	----	----	----	----	.03*	10.70***	2/75
Interfered with Rights	.62***	-.18**	----	----	.77***	----	----	----	----	----	60.76***	2/75
Prevented Nec. Repair	.66***	----	.37***	----	----	----	.43***	----	----	----	74.22***	3/74
Anger Toward Town	.70***	-.26***	----	----	.52***	----	----	----	----	-.02**	42.47***	4/73

*p < .05

**p < .01

***p < .001

The R2s here represent standardized regression coefficients. The beta weights in each step-wise regression analysis are indicated for the variables which explained the variance within the acceptable cut off rate of < .05. In Group 1, all respondents, N = 274; Group 2, property owners, N = 253; and Group 3, island residents, N = 116. (These initial analyses contained predictors of stress, marital law, insurance, damage, demographic, and other variables indicated as predictors in the literature review.)

that martial law was a necessary precaution. The findings in Group 2, owners of property on the island, very closely resemble the responses from the entire group of islanders.

Among those who held their primary residences on the island, Group 3, feelings were similar to those of Group 1, that martial law was a necessary precaution ($r^2 = .42$, $F = 17.60$ 3/74 df, $p < .001$). This was more negatively related to a feeling of anger toward the town ($b = -.73$, $p < .001$), positively related to the feeling about the value of this declaration for declaring the cost of living coverage from insurance companies ($b = .37$, $p < .01$), and negatively related to the age of the head of household ($b = -.03$, $p < .01$). Strong feelings persisted in this group with regard to the prevention of the necessary repairs and interference with rights. The two strongest prediction equations with regard to the feelings of martial law in terms of explaining the variance in this group are anger toward the town ($r^2 = .70$, $F = 42.47$, 4/73 df, $p < .001$) and prevention of the necessary repairs ($r^2 = .66$, $F = 74.22$, 3/74 df, $p < .001$). It is significant to note that the anger toward the town is negatively related to the satisfaction with insurance company treatment ($b = -.18$, $p < .05$). The high r^2 's indicate the intensity of the feelings on the part of primary residents dealing with the daily problems of damaged property and insurance companies.

In all groups, the feeling that martial law interfered with a personal right to return and examine property damage was a function of whether or not one experienced an initial sense of anger and frustration at being kept from making necessary property repairs and whether or not one was angry or resentful over the absence of more citizen voice in decisions immediately after the hurricane. A positive hurricane stress score--which was calculated by dividing the sum of scores on the life events scale into the sum of such hurricane stress items as misrepresentations or other problems in dealing with insurance representatives or contractors, new and overwhelming demands on time, and the like--increased the amount of variance explained in the above tables. This effect is present for the entire sample and for Sullivan's Island property owners. In all groups, feelings of anger and frustration that martial law kept one from making the necessary repairs to property was a function of a feeling of interference with one's right to return and examine property damage and a sense of resentment toward the town for a perceived absence of citizen voice in decisions after the hurricane.

RESPONDENT COMMENTARY

The Survey

Many people who responded were grateful someone was taking time to ask about their problems. "Thanks so much for this questionnaire," one wrote. "This is an excellent survey," said another. After the mailings, others stopped us on the street to say thanks. This does not mean all comments were flattering. Wrote one respondent,

This survey is incredibly slanted towards bad experiences. In my opinion the results will be biased. I get the feeling that you have definite expectations or a desired result. This is an example of very poor research.

Nor were people enthusiastic about filling out a 12-page questionnaire:

This is the seventh survey I can remember. I've thrown the others out. I don't want to be someone's laboratory rat. I've been through enough and it continues. I only answered this because you were fellow residents. I would like to be more helpful but I am drained to the limit.

Stress

Responses to the open-ended questions and the spontaneous comments of people who filled out the questionnaires bring the statistics to life. Few found the hurricane inspirational. Testimony about "renewed religious faith," succeeding through adversity, or achieving character development by hurricane were scarce, numbering barely a dozen. Upbeat comments about "taking it" or "bouncing back" and descriptions of the hurricane as an adventure were equally rare. Also few in number were the statements of complete desperation, but some were present. "Separated from wife, business partnership broken up, debt rising," said one. "Suicidal," wrote another. "Will life ever be the same?" a third asked. Several of the more fortunate residents understood what others were going through and felt guilty about it: "I suffered less than my neighbors. This made me want to help others. I didn't want to have no answer when asked later, 'What did you do?'" When people wrote of lessons learned they reflected them through pain. Said one,

I will never again feel as secure. I have lost faith in officials who think they know what is best for everyone. I can take care of myself better than anyone else can.

Another wrote, "I learned a lesson the hard way. I am not so tolerant now. I'm too nice and this results in getting stepped on too often." Most common were statements of apprehension: "I fear it will happen again"; incredulity: "initially unbelievable"; and irritation: "inconvenient as hell." There were any number of variations on the theme that life after the hurricane seemed, as one resident put it, "less

purposeful, less optimistic, and less satisfying." Said another resident, "The recurring adjectives of feeling describe a thesaurus of misery: unsettled, frustrating, helpless." Wrote still another, "Feelings? Indifference, intolerance, suspicion, distrust, anxiety, everything that goes with a disaster." Stress and dread were omnipresent. Entrepreneurs in particular more than had their hands full dealing with the destruction to their establishments, rebuilding their businesses, and juggling the needs of employees, many of whom had their own range of problems.

Many refused to measure their losses only in dollars: "It destroyed the large trees. Everything else can be replaced," wrote one resident. "I would rather have lost my house than my trees," another echoed. A young mother wrote, "I lost the first year of my baby's life dealing with this. I neglected pictures, keepsakes, and other family members." Said one islander, "My life is divided into 'before' and 'after' Hugo and will likely remain so for a long time." Underlining the personal agony felt by many, one person wrote, "It was much easier to get over the death of [a spouse] than to get over Hugo." Would the stress abate? Wrote one typical respondent,

There is a tendency to deny how much one has suffered. The anger, frustration, grief, and sense of violation and of loss can be compared to the aftermath of an assault. The emotional stress seems to go on and on.

Insurance

People commented profusely about their experiences with insurance companies. The most common was that policyholders needed more and better information. "Coverage should be thoroughly explained to homeowners," said one. "Make insurance agents sign off whether all elements of coverage were explained and offered when writing policies," declared another. A few claimed that they had been deceived: "I was led to believe that I had replacement value when in fact, because the house was not my primary residence, I got much less," said one aggrieved writer. "Make the bad faith statute clearly applicable to catastrophic situations and property insurance claims," suggested another. People recounted the inevitable occurrences of bureaucratic inefficiency in handling claims, including this:

The person in charge of the claims office in [another state] did not seem to understand that my property was on an island that we could not begin to salvage anything for over two weeks.

Some respondents were more sympathetic: "No insurance company in the world could have been adequately prepared." Overall, the experiences were summed up this way: "Dealing with insurance adjusters is the pits."

Martial Law

Written comments volunteered by respondents on the returned questionnaires underline some hardened attitudes. "Our government failed us all," said one resident. "The decision (to bar access) was absurd," added another. "Thieves never could have taken or caused the loss I had because I could not get there." Harsh criticisms spared no one. "We need to enforce constitutional right of access to one's personal property," one person wrote. "The National Guard was no help, stole some of my property." "Lazy bastards should have been working to help residents," said another. For one, "Dealing with the primary effects of Hugo, the actual destruction, was not nearly as frustrating as dealing with the total inability of local government to make rational decisions on behalf of residents' needs." Said one who intended to remember,

Being held off the island at gunpoint was inhuman and a foolish action by people we elected. There were no dangerous snakes. I saw several national guardsmen smoking, which made me wonder about the propane danger. In all, I feel martial law was a serious stressor for all residents. I hope the voters don't forget when the elections draw near.

Support for the decisions officials had made was equally intense. "I was very much in agreement with martial law on the island despite my desire to get there and survey the damage," wrote one resident. Added another,

Repairs could not have been accomplished in the short time people were kept off the island. It was necessary to see the total picture, not individual, personal needs. Officials were elected to represent people and are responsible for making decisions. Any failures can be dealt with in subsequent elections.

Two comments sum up the extremes: "Nobody died," wrote a supporter. "I will never evacuate again," warned an angry critic, "but I will have ammunition."

CURRENT FEDERAL PROGRAMS³

The National Flood Insurance Program

As it affects coastal communities, the present federal insurance program has two origins. The first comes from the private sector insurance industry, which developed businesslike ways to offer protection against property loss from fire and wind by offering policies at prices which attracted enough buyers to spread the statistical risk of any one loss. The second is from the need to provide protection against flooding, which could only come from the public sector.

The origins of the federal flood insurance program can be traced back to legislation enacted in 1936, when Congress established that riverine flood control was a proper federal activity and mandated, after certain conditions were met, that public or private property could be protected by federally funded projects. The same year, Congress also passed a companion beach erosion control bill, but it specifically limited federal construction assistance to the protection of government property. In the ensuing years, residents and communities in the coastal zone regularly pressed Congress to allow federal expenditures for construction to protect against coastal flooding, but these entreaties met with limited success.

By the early 1950s, the curve of property losses from flooding in river valleys and along the ocean and gulf coasts during hurricanes was rising rapidly. Unlike protection against loss from the perils of fire and wind damage, people could not buy affordable insurance against flood damage and loss because private insurance carriers could not afford to offer it. The economics are simple: people living on the top of a mountain or elsewhere outside the flood plains have no reason to purchase flood insurance. Those residing in the hazardous river valleys and coastal flood plains could not afford pay the high premiums insurance companies had to charge because the risks were spread among too few policyholders. The result was an increasing demand for the federal government to step in.

After a series of natural disasters stretching from 1951 to 1956, Congress responded, enacting a Flood Insurance Act in August 1956 and creating a Federal Flood Indemnity Administration. Discussions between the Federal Flood Indemnity Administration and the insurance agencies ultimately produced a draft plan which satisfied no one but made two points clear: (1) any federal flood insurance system would affect flood plain development, and (2) the federal government would have to bear the cost of subsidizing insurance premiums for occupants in the flood zones. At the time, Congress was not interested in adding to the federal budget by underwriting flood losses. As the package of flood insurance legislative proposals before Congress also suggested that any insurance program would be followed by an uneconomic invasion

³Material in this section is taken from Moore and Moore (1989, 1991).

of the flood plain, Congress abolished the Federal Flood Indemnity Administration, allowed unspent funds to revert to the Treasury, and took no action to implement the insurance law, which remained on the books.

In 1962, the Eastern seaboard experienced the worst storm ever to strike the Atlantic Coast (until Hurricanes Hugo and Andrew). Responding to an outcry for action, in 1965, Congress, in the Southeast Hurricane Disaster Relief Act, required the Housing and Urban Development Agency to study disaster insurance for people who suffered property losses in natural disasters. Resources for the Future, a private foundation working under contract to a congressional committee, soon produced a comprehensive study which recommended a federal flood insurance program that combined ways to provide relief with land use regulations that would require stronger construction in the flood plains and coastal zone. Simultaneously, another advisory committee organized under the authority of the Bureau of the Budget recommended that flood insurance provide financial assistance for victims of flood disasters in order to rehabilitate their property yet help redirect the use of land prone to flood damages. In August 1968, Congress adopted the recommendations by enacting the National Flood Insurance Act and creating a Federal Insurance Administration within the Department of Housing and Urban Development.

The new legislation aimed to establish a federally assisted national flood insurance program to assure a workable method of pooling risks, minimizing costs, and distributing burdens equitably among property owners and taxpayers. As a condition for eligibility for federally subsidized flood insurance, communities had to adopt and enforce land use and control measures to reduce the probability and severity of future flood damage. Three basic ideas were involved. One was that owners of existing structures in flood prone areas would be assisted by having the insurance premiums reduced. The balance would be paid by the federal subsidy, but there would be no insurance subsidies paid for new flood plain occupancy. A second was that, as a matter of public policy, federal insurance would not be made available to localities which did not inform people about known flood hazards. The third was that the federal insurance program would be voluntary in terms of community participation and individual purchases of insurance.

As the saying goes in Washington, there is a big difference between authorizing and funding new programs. What the insurance programs promised in concept was withheld in execution. Land-use regulations required detailed and time-consuming studies which the Federal Insurance Administration did not have the capability to conduct. The Corps of Engineers had the capability but was not granted the funding to make use of its technical expertise. As a result, it proved impossible to map the special flood hazard levels at which new construction would be safe from flooding under the conditions of the 1% chance flood, and the actuarially sound rates for insurance coverage could not be established rapidly. The

lag restricted the rate at which communities entered the program. During the first year only four out of the 20,000 communities with flood hazards joined and only 20 policies were sold. When Hurricane Camille struck in 1969, between 75 and 100 studies were under way, but only two communities were in the program. After Camille, Congress hurriedly amended the National Flood Insurance Act to provide an emergency phase during which insurance would be provided to communities before the studies and maps were completed. Under the emergency program, property owners in eligible communities could obtain insurance coverage on existing structures at federally subsidized rates even though the studies and rate maps required would not be completed for some time. Communities now had only to apply and agree to adopt minimum land use and control measures to guide new construction in flood prone areas. By 1973, the emergency phase provision had attracted some 3,000 communities.

A series of flooding disasters struck the nation in 1972. In June, tropical storm Agnes caused extensive damage in Wilkes Barre, Pennsylvania. Investigations after the storm revealed that only two flood insurance policies were in effect in the entire city. The greatest tragedy was suffered in Rapid City, South Dakota, where a flash flood on June 9 cost at least 238 lives and caused damages estimated at over \$18 million. Only 29 flood insurance policies had been purchased. Behind the tragedy, analysis revealed, was a local push for land development so strong that formerly strict zoning regulations had been loosened by the municipal government. Congress now strengthened the program, providing in the Flood Disaster Protection Act of 1973 that, as a prerequisite for federal financial assistance for purchasing or constructing structures in flood hazard areas, communities had to establish land use controls and individuals had to buy flood insurance. As amended, the Flood Insurance Act now provided for a two phase implementation. The emergency program made flood insurance available to existing properties at heavily subsidized rates. During the phase of emergency protection, communities were to adopt and enforce minimum standards as set forth by the Federal Insurance Administration. When a detailed engineering study was completed and a flood insurance map published, the regular program went into operation.

Passage of the Flood Insurance Act marked an important change in federal flood control policy. Primary responsibility for managing the flood plains still remained with local government, but now development was to be guided. The act's premise was to return to the landowner the cost of flood damage and shift the burden from the taxpayer. Instead of a policy which deferred the cost of flood plain occupancy to developers, who in turn passed along the costs to those who purchased the property, the federal government now was moving in the direction of programs that required recognition of all costs prior to any development.

The sequence of developments has an important bearing on hurricane loss. There now were two types of insurance coverage. One, offered by the private sector, protects against fire and wind damage.

The second, backed by the federal government and sold through private companies, protects against flood damage. The separation makes sense in that, in the interior, homeowner or wind policies protect against a peril that occurs without flooding, while inundation in river valleys normally occurs without high winds. But hurricanes combine the high winds and coastal flooding; because no witnesses stay around to observe the destruction, assigning a specific cause to storm damage can be difficult.

A second problem with hurricanes relates to the difficulty of defining potential areas of destruction. A similar problem appeared at the beginning of the federal flood insurance program. Then, inadequate funds prevented the Federal Insurance Administration from identifying hazard areas without gross errors in mapping. In the early years, communities had confronted inaccurate, easily refutable technical data, inadequate flood maps, delays in getting data and maps, and difficulties in obtaining corrections. With limited staff, the Federal Emergency Management Agency could not provide adequate technical assistance or monitor 17,000 communities, and the enforcement and administration of regulations varied. In time, many of the problems were solved, and the necessary flood plain maps were produced. While extremely useful in pre-disaster planning in determining regions where people should be warned to evacuate, the maps defined only areas prone to flood damage. And only those communities were required to enact the land use and construction codes up to the standards necessary to be eligible for the subsidized federal flood insurance program.

Emergency Response and Emergency Management

Creation of the Federal Emergency Management Agency as a central coordinating body marked a second change in federal policy. Heretofore, when flooding or hurricane disasters struck, on many occasions the Army Corps of Engineers served as both the coordinating agency for relief efforts and a relief agency. On paper, the new system promised to make relief efforts more efficient. In practice, this was not always the case. For most of its existence, FEMA has been lightly funded. Directors and other top staff have tended to be political appointees. Because FEMA is neither highly visible nor important in the Washington bureaucratic hierarchy, it did not attract the best managerial talent. Oriented to saving money, when disasters struck, FEMA was often more tuned to bureaucratic procedures than providing the swiftest relief. And at times, in the opinion of hard hit communities, the FEMA relief efforts themselves have left much to be desired. Many of the problems are directly traceable to size. FEMA has two missions: to plan for emergencies, which does not require large numbers of people, and to manage federal assistance in the aftermath of disasters, which can require a large staff. Because there is no reason to keep a large FEMA staff sitting around waiting for an emergency to happen, FEMA risks being overwhelmed.

SUMMARY AND RECOMMENDATIONS

Summary

A major natural disaster like Hurricane Hugo is a very sharp blow to individual well being. Sullivan's Islanders rated Hurricane Hugo as more stressful than life events (such as the loss of one's job or the death of a friend) where great stress effects have been observed previously.

Some results obtained here were expected; for example, there was greater concern about living on a barrier island after the hurricane and people felt tension at the beginning of a new hurricane season. Other results, while not wholly unexpected, point to some of the strong forces at work in disaster-affected populations. In particular, the significant relationships among felt stress, economic loss, and anxieties in dealings with authorities in a position to exercise power in one's life, like government officials and insurance company representatives, stand out.

For a substantial portion of the population, few post-storm conditions proved as trying as dealing with insurance companies. In general, people with higher levels of damage and loss and greater uninsured losses were confronted by more problems, had to battle harder to obtain settlements, and reported more dissatisfaction. The evidence that issues of insurance coverage and obtaining settlements is a major post-disaster problem is compelling.

Examination of people's circumstances before and after the hurricane points up the need to provide more disaster preparedness information. One's personal situation before the hurricane shaped much of what came after. We can illustrate the patterns with imaginary people. A Sullivan's Island head of household with two dependents, a heavily damaged mortgaged home, and uninsured losses, who wanted to get back to the island by boat two days after the hurricane but was prevented by township decrees from doing so, who now has to be away from work to take care of family and property, and is meeting regularly with insurance adjusters, may not exhibit increases in a number of stress symptoms and may feel very charitable toward the town government. But that is not likely.

It is also possible that the head of the household down the street, who insisted on including a number of hurricane-resistant construction features in building or renovating the home, bought insurance policies that covered wind and flood damage to real and personal property (after thoroughly investigating several carriers), who also wanted to return to the island after the storm but was kept away, who maintained good family records and was able to present insurance adjusters with photographs and documentation for losses, could be more highly stressed than the neighbor, and also could be very angry toward the town government. But that is not likely either.

Planning Recommendations: State and Local Governments

Results from the Sullivan's Island study thus far reinforce a number of current disaster planning practices and suggest some new initiatives:

1. *Make Pre-Disaster Warnings More Explicit.* Governments should continue to remind people that the coastal flood plain is a hazard area. Programs to encourage early evacuation in case of an emergency might be supplemented with plans to place permanent markers on buildings and at prominent points in low-lying areas and along evacuation routes. For example, a highway sign on the Ben Sawyer causeway or Isle of Palms connector could read: "This road would be xx feet under water in a Category 4 or 5 hurricane striking the coast at high tide." The practice of visually reminding people they live on a flood plain was introduced successfully in the 1950s in the Tennessee Valley Authority Community Flood Damage Mitigation Assistance Program.

2. *Expand Pre- and Post-Disaster Planning Concepts to Include an Emphasis on Property.* No lives were lost on the barrier islands during Hurricane Hugo because people heeded advance warnings and cleared the coast. Because the federal government invests time and money to track storms and predict where they might strike and because state and local governments invest in plans to warn and evacuate populations, we do not experience the great losses of life that hurricanes earlier in the century cost. A similar effort and planning can mitigate property loss, speed recovery, and hold down reconstruction and recovery costs.

3. *In Pre- and Post-Disaster Planning, Prepare for an Increase in Public Energy, Not Just for a Population of Victims that Need Care.* Post-disaster stress is also post-disaster energy. Depending on individuals and circumstances, stress has both positive and negative effects. The readily measurable increase in stress after a natural disaster will affect a large proportion of the population. Based on this study of Sullivan's Island residents, most evacuees and others are victims only to the extent that they experienced a major problem. As a group, they are not frightened, not incapacitated, and certainly not helpless. They are energized, concerned about their property and possessions, and they intend to take care of their own affairs. They require assistance, resist restrictions. Further, pre-disaster planning offers an opportunity to identify local residents with useful expertise or skills and devise ways to mobilize volunteers to assist government in advance of a disaster.

4. *Upgrade the Importance of Providing Information in Post Disaster Planning.* Public business gets overloaded rapidly in natural disasters. Decisions made under emergency conditions can divide government from citizens. Clear channels of two-way communication are a necessity because disaster victims and evacuees need information and emergency assistance quickly but they do not intend to have their lives controlled. More sophisticated ways for obtaining accurate information rapidly and

disseminating it to people are required to deal with the high level of public energy that exists after a disaster. The 1990 Sullivan's Island Disaster Plan correctly focuses on mechanisms for acquiring this information and maintaining communication channels between government and people. There is more to this aspect of post-disaster planning than just reducing friction. The post-disaster experience of victims and, possibly, the vicarious experience of television viewers, may affect how people respond in the future. Volunteered one Sullivan's Island resident angry about being kept off the island after the storm, "I will never evacuate again, but I will have ammunition." The hard-edged statement reflects an intensity typical of many residents. After Hurricanes Hugo and Andrew, we can expect people to hurry to get out of the path of Category 4 and 5 storms. There may be some danger, however, that a few coastal residents might be tempted to try to ride out storms predicted to be less intensive or to strike a short distance away.

5. *Expand Pre-Disaster Planning to Include Advice on Buying or Building a Storm-Resistant Home.* Natural disasters will continue to occur, but people with less damage are better off. Government has a role to play in teaching people how they can reduce losses. Public advisory publications might say:

- In designing a residence, seek outside advice from a structural engineer.
- Arrange for structural and roof inspections during construction. Do not assume that your contractor will know or apply sound building principles in putting up your house or that your mortgage company, FHA, or VA inspector will point out storm-resisting features they do not require but you might want.
- Know that many South Carolina county codes are minimal standards, in the opinion of experts. They may not require the level of construction necessary to protect your house.
- Before buying, check the property location on the flood map. If the residence is in a flood or high velocity zone (flood plus wave action), see if construction meets the standards of the National Flood Insurance Act of 1973, the prerequisite today for federal financial assistance for purchasing or for constructing structures in flood hazard areas.
- Inspect the foundation and how the house is tied to it. Look for hurricane clips at all floor levels and the roof. Having a structural engineer check the building may be worth the money.

6. *Expand Pre-Disaster Planning to Include Insurance Coverage Information.* People with higher levels of uninsured loss or who experienced problems with insurance companies revealed greater stress and higher levels of dissatisfaction with post-storm government operations. Post Hugo experiences on Sullivan's Island revealed individual problems in the areas of inadequate insurance coverage, inappropriate insurance coverage, and inadequate preparations to document losses. Advice to the public might include the following:

- If you rent, do not assume that your property is covered by the owner of the rental unit.

- Before buying insurance, assume a hurricane strikes and you lose everything. Now, what do you need?
- Read the coverage provisions for policies you are considering to be sure you have protection to the level you want. Replacement value is an important clause in your insurance policy.
- Understand that wind and homeowners (comprehensive) insurance policies and the federally supported flood insurance cover different hazards and are sold separately. Understand also there are two kinds of flood insurance. The basic flood policy protects structures. A separate flood policy covers contents. Understand there are missing links between these policies.
- Your insurance policy is a legal document. Examine it line by line with your insurance agent. Get an explanation for any provision you do not understand. Pay particular attention to definitions and terms, like "covered loss." If your insurance agent tells you the meaning of a term is different from that explicitly stated in the policy, get confirmation in writing from an officer of the company or get another agent.
- The lowcountry is also an earthquake zone. This insurance requires separate coverage.

7. *Expand the Current Pre-Disaster Advice About What to do When a Storm Approaches to Include Property Loss Planning.* The widely available information about long term and immediate hurricane preparations should be enlarged to cover post-storm insurance claims. Such advice might include:

- Remember that to collect on an insurance policy you must have proof of loss. Make a record of everything you have by photographing or videotaping your property. Keep receipts of purchases for major items. Put records in a safe place with your other important personal papers. Take copies with you when you evacuate.
- On returning after the storm, photograph or videotape everything on the premises. Itemize all your losses room by room. Get accurate figures on the replacement costs. Consider getting advances against your final settlement as an alternative to making a quick settlement of your claim. Most insurance companies will either give you cash advances or reimburse you for purchases as you go. Some on Sullivan's Island reported, "I didn't notice that those items were damaged until six months after the storm. My insurance company had given me a healthy settlement, and I didn't want to bother to reopen the claim."
- If you live in a flood zone, evaluate the wisdom of having all your coverage with one insurance company. This will guard you against the crossfire some Sullivan's Island residents initially experienced when an adjuster representing the wind insurance company claimed the damage was from flooding and vice versa.
- When filing a major claim, do not hesitate to use engineers and other outside experts in case the adjuster disagrees with your property or content damage assessment. Do not hesitate to contact an adjuster's supervisor, the state insurance commission, or the media.
- Do not discount the value of your possessions. A few people on Sullivan's Island said, in effect, "We had no real losses; it was an old house, filled with things passed down in the family for years, nothing really of any value." These items were not claimed as a loss. If their value had been assessed, the property recovery might have been worth thousands of dollars.

8. *Broaden the Advice to Residents in Pre-Disaster Planning.* Suggest people take time to consider a worst case. Additional recommendations for personal pre-disaster planning might look like this:

- Take a few Sunday afternoon drives to examine alternative evacuation routes. Ask "what if" questions: What if a tractor-trailer is jackknifed on this bridge? Redo the planning periodically; old highways develop choke points. New roads and bridges get built.
- Before hurricane season, review the fine print in your insurance policy. Seek an agent's help if your coverage needs have changed or if you are still unsure about any clauses.
- Re-inventory household possessions regularly. Include supplementary photographs of all property in your inventory. One set of inventory documents should be stored in the safe deposit box or at a safe place away from the disaster zone. If possible, videotape all contents as well as structural properties.
- On hearing storm warnings, include in your evacuation kit the household inventory and important records. If leaving by vehicle, take work (business) clothing. You may have to go on to your job even if you cannot get back to your home.
- After a warning, in addition to protecting your property as best you can in the time available by taping windows and storing breakable items, and the like, prepare to deal with the insurance adjusters. If you forgot any of the preparations suggested above, now is the time to get the photographs and make records.
- If you have purchased or built a house on piers or pilings, remember that no possessions below the first living level are covered under insurance policies issued under the National Flood Insurance Act. Before evacuating, move outdoor tools, the lawn mower, boating equipment, barbecue grills, picnic tables, etc., to the first living level. Photograph the preparations. Your picture of the lawn mower that usually lives outside in the shed but now sits in your flood-insured living room proves that you took the necessary steps to protect your property.

9. *Lobby to Develop a Better Emergency Response System.* Emergency management and emergency response are two different things. Separate them. Put in the hands of the Army Corps of Engineers the responsibility for planning the federal emergency response and overseeing its operations in the early days after a natural disaster. The armed services have the people, the equipment, and the organizational systems the emergency demands. The Corps has long experience in working with Congress and state and local governments, experience in multi-agency and multi-government planning and resource management, and, of course, ties in the military chain of command. Simultaneously, reshape today's Federal Emergency Management Agency into an administrative unit to coordinate and manage the federal post-disaster programs that must continue long after the immediate crisis ends. Give the Corps responsibility for coordinating multi-agency federal planning for a military-headed federal disaster response. As the emergency phase passes, phase the revitalized FEMA in and the military out.

10. *Lobby to Speed Up Federal Reaction Time.* A rapid federal response is absolutely necessary. Large and medium size cities may have many agencies and experienced staffs, and with good planning they can begin to gain control over the disaster responses very quickly. But even the largest and best prepared governments need rapid assistance from federal and state authorities in the first hours after a storm. This is especially true after hurricanes, which knock out electric power over many square miles. Small communities will need the assistance for a longer period.

11. *Strengthen Construction Codes in Hazard Zones.* The best time to lower hurricane damage is well before the storm hits. Insurance companies, taxpayers, and potential hurricane victims have a common interest in moderating future costs. In a hurricane there is immediate destruction and damage from wind, water damage from surges and tidal flooding, water damage to standing structures and contents after roof coverings and vents are blown away, and further damage from post-storm rains that may continue for some time. Coupling incentives for state and local governments to promote stronger construction to the percentage of the disaster cost the federal government will bear can lower damages in all three areas. One model is the National Flood Insurance Program, which leaves responsibility for managing flood plain development at the local level but requires communities to comply with federal construction and development standards to be eligible for participation. In a federal hurricane disaster program, a federally supported mapping program would identify potential hurricane disaster areas. As a condition for a designated percentage federal participation in emergency disaster recovery costs, state and local governments in the zones would be required to enact building codes to federal standards to minimize wind and flood damage, and also to maintain the necessary strict inspection systems to insure that builders complied. As in the flood insurance program, structures now standing in the hurricane hazard zones could be grandfathered in, but not their replacements.

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