Quick Response Report #120

ASSESSING "PRACTICAL KNOWLEDGE" OF FEMA'S RESPONSIVENESS AND EFFECTIVENESS IN THE AFTERMATH OF HURRICANE BONNIE, IN WRIGHTSVILLE BEACH AND TOPSAIL ISLAND, NORTH CAROLINA

Melissa L. Tollinger
Deborah Dixon

Department of Geography
East Carolina University
Greenville, NC 27858-4353
E-mail: tollingerm@mail.ecu.edu

1999

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This material is based upon work supported by the National Science Foundation under Grant No. CMS-9632458. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

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INTRODUCTION AND CONCEPTUAL FRAMEWORK

With the passage of the National Flood Insurance Act in 1968 and the creation of the Federal Emergency Management Agency (FEMA) in 1979, federal and state governments committed themselves to a long-term and wide-ranging program of hazard management. Given FEMA's goal of developing, "a public educated on what to do before, during and after a disaster to protect themselves, their families, their homes and their businesses," the effectiveness of its organization and programs must be assessed on the basis of case study analysis of: 1) before and after disaster planning by the agency; and 2) the extent and substance of the public's "practical knowledge" of a particular hazard. This research undertakes the second of these tasks through a case study assessment of the public's preparation for, and response to, Hurricane Bonnie, which hit the coastal communities of southern North Carolina, August 26-28, 1998.[1]

Recent hurricane history along the East Coast has tested FEMA's resources, leading to the development of specific predisaster planning strategies (i.e., mitigation procedures) and postdisaster relief programs (i.e., the Federal Response Plan, Individual Assistance, Public Assistance, Continuity of Government Planning, and so on). Previous evaluations of FEMA's effectiveness have focused on the development and implementation of its programs in South Carolina, Louisiana, and, most recently, Florida, and, using a behaviorist theoretical framework, have addressed the public's perception of the agency in these locations. Such perceptions have been correlated with various socioeconomic variables within the sample population, as well as miscellaneous characteristics such as extent and type of previous experience of hurricanes and access to media sources. These previous case studies have been underpinned by the hypothesis that hurricanes such as Hugo (1989), Bob (1991), Andrew (1992), Iniki (1992), Opal (1995), and Fran (1996), while prompting several programmatic initiatives on behalf of FEMA, were not effectively dealt with by the agency due to relative inexperience with this form of disaster. Furthermore, it has been concluded that in general public perception of FEMA is negative, particularly in regard to the timing and amount of postdisaster relief.

While we intend to contribute toward the broadly defined research avenue noted above through a case study of Wrightsville Beach and Topsail Island community experiences of a hurricane hazard, we approach the issue from an explicitly realist stance. In contrast to behavioral methodologies, realism proposes that individual thought and practice, summarized by the term "practical knowledge," are the product of wider social relations of power within which the individual is embedded. More specifically, individual practices and beliefs are embedded in structures in the sense that they cannot be understand without reference to the larger structural conditions that enable them, or make them possible. In speaking of structural conditions, realists refer to sets of social relationships that interconnect actors according to routinized modes of behavior and thought. These routines are established and maintained through the individual's participation in various social relations such as capitalism, gender and race relations; in institutions such as the family and government agencies; and in the shared ways of understanding - or ideologies - that such relations and institutions produce. In consequence of this line of reasoning, the diverse variables noted within behaviorism are not taken as mere "facts" capable of explaining specific events in and of themselves. Rather, they form an entry point into an in-depth analysis of the necessary and contingent structures that make possible the existence, form, and extent of such events. Furthermore, whereas in behaviorist methodologies correlations across space are presumed to be indicative of a causal connection, in realism it is the unique intersection of social structures in place that becomes the object of interest.

In regard to the production of practical knowledge concerning a hazard such as Hurricane Bonnie, FEMA can be conceptualized as a contingent, yet very significant structure in the shaping of attitudes and practices both before and after such an event. As a structure, FEMA operates at the national, regional, and local scale via specific mechanisms, such as its Regional Operations Center in Atlanta. In assessing the particular local impact of such mechanisms, their intersection with other, locally manifest, contingent structures and their associated mechanisms must be noted. Such contingencies include: other government agencies such as the North Carolina Division of Emergency Management, as well as local county and city governments, and military centers; private social support groups such as the Red Cross and the Salvation Army; and media, including TV, radio, and newspapers. In order to elucidate the most significant of these contingent structures in regard to their impact upon FEMA activities, we examine two communities, one in Wrightsville Beach and the other several miles further north on Topsail Island. Both communities have had experience of hurricanes in the recent past, including Hurricanes Bertha and Fran in 1996.

METHODOLOGY

Realism employs retroduction as a methodology, wherein the hypothesized necessary and contingent structures and their associated mechanisms are laid out at the onset of the study (as in the previous section). Then, the specific manifestation and of these structures and mechanisms are assessed in situ through extensive research methods, such as structured surveys and archival research. Following such an assessment, the relative significance of both necessary and contingent structures can be re-evaluated at a theoretical level, and more intensive research methods can be brought into play, such as focus group and key informant interviews. It is at this stage that the complex of factors allowing for a particular event to take place can be detailed. Finally, the research conclusions can be used as "clinical inference" for succeeding case studies.

As an initial means of assessing the manifestation of these structures and their associated mechanisms at the local level in both Wrightsville Beach and Topsail Island an eight-page survey was developed that included closed questions concerning the socioeconomic status of the respondent, and open-ended questions regarding: previous experience with hurricane hazards in the area; respondents' preparedness for Hurricane Bonnie; the various impacts Bonnie had on themselves and their property; and their experience of, and evaluation of, FEMA, as well as state and local emergency management services. The survey was distributed to residents in two communities, Wrightsville Beach and Topsail Island, on September 19, 1998, in the following manner: in each community the research team of twelve was divided into groups of two; six streets were chosen on the ocean-side, and then on the sound-side, of the island (twelve streets overall); each street was then canvased by a pair of research assistants who knocked on every door and, wherever possible, asked that a survey be completed. Some of the surveys were picked up from the residence after a period of two hours - the remainder were to be mailed in.

WRIGHTSVILLE BEACH SURVEY RESULTS

Wrightsville Beach

Survey Results: (38 responses out of 56 distributed)

Socioeconomic Profile of Respondents:

Attribute	**% of Respondents** (as a measure of those responding to the question)
Gender:	
Male	38.5
Female	61.5
Age:	
18-29	26.3
30-39	52.6
40-49	23.7
50-59	31.6
60-69	18.4
70 and over	18.4
Education:	
High School	100
Some College	27.6
Four Year Degree	37.9
Master/Ph.D.	34.5
Household Income ($):	
Less than 30,000	6.5
30,000-49,999	29.0
50,000-69,999	9.7
70,000-89,999	9.7
90,000 and over	45.2
Occupation:	
Self-employed	20.0
Service Sector	20.0
Prof. white-collar	60.0

Employment Status:		
Employed	62.2	
Unemployed	5.4	
Retired	32.4	
Property Location:		
Directly on Waterfront		26.3
On waterfront behind dune		5.3
Non-waterfront, but within 1000 feet		60.5
Beyond 1000 feet		7.9
Length of Residency:		
Less than I year	2.6	
1-4 years	10.5	
5-9 years	13.1	
10 years and over	65.8	
Entire Life	7.9	
Residence Type:		
House	94.7	
Apartment	2.6	
Condominium	2.6	
Mobile Home	0.0	
Tenure:		
Owner	92.1	
Rent/other	7.9	
Value of Residence ($):		
80,000-99,999	2.7	
100,000-199,999	2.7	
Over 200,000	94.6	
Hurricane Preparedness, Experience, and Aftermath:		
Insurance:		
Homeowners	22	
National Flood	25	
Hail and Wind	12	
Other	10	
Public Meetings:		
Are aware of?		
Yes	89.5	
No	10.5	
Of those aware of, did participate?		
Regularly	6.1	
Once	24.2	
Never	69.7	
Of those participating, were the meetings useful?		
Yes	91.7	
No	8.3	
Awareness of literature on hurricane hazards:		
Yes	94.7	
No	5.3	
Of those aware, was the info useful?		
Yes	97.1	
No	2.9	
First means of info on Hurricane Bonnie:		
Television		75.6
Newspaper		6.7
Word of mouth		6.7
Radio		4.4
Other (internet, etc)		6.7

In sum,

1. All were aware of the hurricane before it hit, most a week before. All have some form of insurance.
2. Most stayed (only five left, and these had second homes, or went to hotels in Raleigh or Greensboro). Some evacuated because of their previous experience with Fran, others because local officials asked them to.
3. Most were aware of local preparation meetings, but only four went to one. Most of the information received at these meetings related to property damage and evacuation procedures. One resident, whose occupation was in

emergency rescue, commented that TV was more useful than these meetings, even though he himself had never gone to one.
4. Most residents suffered some slight damage in the form of erosion and wind damage to roofs.
5. Overall, beach erosion in the area was blamed on an increasing number of storms combined with a lack of adequate coastal protection
6. All were aware of the existence of FEMA, but no one received aid from this agency. Information about the agency was gained from all manner of media including TV, word of mouth, informational literature and even the internet.
7. All felt that the local response (management office, and the emergency services consisting of police, fire, rescue, Coast Guard, etc . . .) was satisfactory and effective. All were happy with the county response; four were not happy with the state response; and nine were not happy with the federal government response.

PHYSICAL IMPACTS OF HURRICANE BONNIE ON WRIGHTSVILLE BEACH

I. Inlet at northern end of island

The inlet appears to have been migrating southward resulting from hurricane-related erosion. Sand pillows have been placed along the shore in an effort to halt the erosion. Sand pillow placement extends from below the water line to the upper foreshore. Overwash deposits from Hurricane Bonnie (shells, coarse sand), are present above the pillows and serve as an indication of the storm surge magnitude. Whereas the pillows appear to have provided some protection from wave and surge erosion, they are currently being undercut by current running through the inlet.

A large sand bar has developed in the north side of the inlet. It is thought that the bar is the result of the south-flowing longshore current. The movement of beach sand offshore during the storm likely aided in the bar development by providing excess sediment to be transported.

A beachfront hotel adjacent to the sand pillows (likely the organization who placed them) had minor wind damage and was closed for repairs.

Loss of dune sediments was obvious at the north end of the island. The most prominent evidence was the exposure of boardwalk piling, which had previously been buried in a dune.

The saltwater marshes adjacent to the northern inlet showed no evidence of storm damage.

II. Foredunes

A large foredune complex (2-3m high) fronts housing structures along Wrightsville Beach. The foredunes are moderately stabilized by beach grass along the top and leeward sides. Sand fences have been placed along the tops and in the troughs of several dune sections.

Several segments of the dune front show approximately 0.5m to 1m of landward migration. This was particularly apparent along the north beach where migrating sand had partially covered an access walkway through the dunes. The sand movement is interesting because of the implications it has for wind speeds in the area. The dunes were partly stabilized by grasses, which significantly reduced shear stress at the sand surface.

Additionally, heavy rains had saturated the sand prior to exposure to high winds. The surface tension of water in the sand matrix acts as strong binding agent, thereby immobilizing sand in even high wind regimes. Further study might address the exact nature of aeolian erosion under these conditions.

TOPSAIL ISLAND SURVEY RESULTS

Topsail Island

Survey Results: (14 responses out of 20 distributed)

Socioeconomic Profile of Respondents:

Attribute	**% of Respondents** (as a measure of those responding to the question)
Gender:	
Male	46.2
Female	53.8
Age:	
18-29	0.0
30-39	0.0
40-49	30.8
50-59	46.2
60-69	0.0
70 and over	23.0
Education:	
High School Only	38.5
Some College	7.7
Four year degree	38.5
Masters/Ph.D.	15.4
Ocupation:	
Prof. white collar	37.5
Service Sector	37.5
Military	12.5
Other	12.5
Employment Status:	
Employed	61.5
Unemployed	0.0
Retired	38.5
Income ($):	
Less than 10,000	0.0
10,000-29,999	23.1
30,000-49,999	23.1
50,000-69,999	0.0
70,000-89,999	7.7
90,000 and above	23.1
no answer	23.1
Property Location:	
Directly on Waterfront	0.0
On waterfront behind dune	46.2
Non-waterfront, but within 1000 feet	53.8
Beyond 1000 feet	0.0
Length of Residency:	
Less than I year	7.7
1-4 years	23.1
5-9 years	15.4
10 years and over	53.8
Residence Type:	
House	76.9
Apartment	0.0
Condominium	0.0
Mobile Home	23.1
Tenure:	
Owner	92.3
Rent/other	7.7
Value of Residence ($):	
Less than 20,000	7.7
20,000-49,999	15.4
50,000-79,999	7.7
80,000-99,999	15.4
100,000-199,999	46.2
Over 200,000	7.7

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Hurricane Preparedness, Experience, and Aftermath:
Insurance:
        Homeowners              38.5
        National Flood          53.8
        Hail and Wind           53.8
        Other                   30.8
        None                    23.1

Public Meetings:
        Are aware of?
                Yes             30.8
                No              69.2

        Of those aware of meetings, did participate?
                Regularly       50.0
                Once            0.0
                Occasionally    25.0
                Never           25.0

        Of those participating, were the meetings useful?
                Yes             75.0
                No              0.0
                Somewhat        25.0

Awareness of literature on hurricane hazards:
                Yes             61.5
                No              38.5

        Of those aware, was the info useful?
                Yes             87.5
                No              12.5

First means of info on Hurricane Bonnie:
                Television              92.3
                Newspaper               0.0
                Word of mouth           7.7
                Radio                   0.0
                Other (internet, etc)   0.0
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In sum,

1. All were aware of the hurricane before it hit, most three days in advance.
2. Everyone prepared for the hurricane and half evacuated. For those who stayed this was due to lack of concern, or concern over personal property. The residents who did evacuate went to nearby residences of family/friends in Wilmington and/or Jacksonville.
3. Most were not aware of local meetings on hurricane preparedness.
4. Most residents reported minor damage and injury and emotional distress. Two suffered major damage, including loss of porch with porch furniture, fence, boat, and flooding.
5. All were aware of FEMA, but only one received aid from this agency. Information concerning FEMA came from TV and newspaper and word of mouth. The remainder received no aid or were unaware of the dispersal, even those who had dealt with previous storms and hurricanes. One resident even responded, "FEMA was one of the worst experiences I have ever had in my life. I cannot say enough bad about FEMA." Another resident echoed a similar sentiment, ". . . FEMA has not yet reimbursed the town for expenses incurred during Fran." In addition, the same owner thought, "FEMA likes to change the rules," and that "They are dragging their feet."
6. All were happy with local and county aid, only half were happy with the state response, and no one was happy with the federal government response. One resident mentioned, "Poor communication from officials to residents and homeowners." He also went on to express his concern over "cooperation between government entities and local communities, and eliminating, 'red tape' delays caused by standing Federal regulations."

PHYSICAL IMPACT OF HURRICANE BONNIE ON TOPSAIL ISLAND

The central reach of the island was characterized by many foredune breaches, with the volume of washover sediment increasing as one traveled northward. Friday's local newspaper indicated 27 dune breaches on Topsail as a result of

Hurricane Bonnie. The overwash volume was striking along this portion of the beach. Sand eroded from the foredunes, and probably from the beach, had been moved inland and covered the roads behind the dune line. The roads had been graded to make the roads passable. The washover sediment was roughly 50cm thick immediately behind the beach, decreasing to zero about 200m inland, just short of the main N/S road. Beyond this point there was no direct evidence of washover.

A large breach (300m wide) was interrupted by a section of resilient, vegetated foredune that withstood the hurricane. Behind the resilient foredune washover sediment thickness was reduced by roughly half. The resilient foredune is heavily channeled (micro-sapping heads) on the leeward side, indicating overtopping by waves or over-saturation by waves and rain. Plastic water pipes that were thought to be part of a sprinkler system protruded from the top of the resilient foredune. The presumption is that the sprinklers were used to maintain a healthy grass cover, which helped the dune withstand the storm surge. This management procedure remains to be confirmed. Whether sprinkler systems were present on blown out dunes is unknown.

Several sections of eroded dunes (from wind and wave action) fronting homes have been rebuilt with sand loads trucked in from elsewhere. The sand has been piled to replace dune material lost during the hurricane from wave erosion. In areas new sand has been piled to extend the dunes as much as 3m shoreward. The rebuilding of eroded, or lost dunes, raises several questions. For example, no attempt has been made to shape the new piles of sand and so it is unclear how they will respond and if they will develop into stable dunes. Some consideration of sand characteristics should be made to ensure the nourishment sand is appropriate to be stable in the environment. The re-vegetation of the new "dunes" is also an important consideration in dune stabilization.

Further north, two stilted homes were observed within the beach zone. It is unknown if the houses were originally built in the beach zone or if they were stranded there because of landward migration of the island. Wave swash appears to have run completely through the home foundations during the storm and sand pillows had been placed next to the foundations on the beach side. The foundations of both homes were being reinforced with fill to replace lost sand. One of the homes used a poorly sorted sand, fine sand, and silt mixture as fill. This material was shipped in from some other location. The mixed, fine sand may not be as resistant to future erosion because the fine sand and clay fraction of the soil will likely be washed away very quickly with the first wave contact.

A conversation with the owner of one of the homes (the one reinforced with mixed fine sand) revealed that this home was built with an expensive ($40,000, he said) reinforced concrete foundation, which he felt was the reason his house survived Hurricane Fran whereas others did not. Examination of this foundation showed that the reinforced cement base and stilts were supported by wooden pilings that had been exposed by beach erosion during hurricane Bonnie (about 1m of exposure).

At the northern end of the island washover sediment extends from the ocean to sound side. This area was much more prone to long-distance washover because of the lack of dunes along the beach front. Many of the washovers coincide with shallow bridges on the main road, indicating that these were regular events that occur in lower magnitude storms. Few structures are present in these areas though there are homes immediately adjacent.

In one washover, a wide mouthed, vertical cement pipe protruding out of the ground provided a view of the island soil underneath the washover sediment. The pipe was situated near the midpoint of the island width. A measurement taken inside this pipe showed a roughly 20cm depth of surrounding washover sediment.

Washover sediment depth appears to vary along the washover cross-section with deeper sediments concentrated in pre-existing channels. A hole was dug in a different location in the same washover. The depth to the pre-storm grass was about 15cm. Washover sediment that reached the sound-side of the island has been eroded in places. The unconsolidated, unvegetated washover sediment makes it susceptible to erosion by low-energy waves off the sound.

INITIAL CONCLUSIONS AND FUTURE DIRECTIONS

From our initial survey, it would appear that whilst some socioeconomic conditions are similar in both areas -

particularly family, gender, and life stage - others, such as class relations and government institutional activities, are not, and that these are productive of differences in practical knowledge concerning hurricanes as a potential hazard, and the roles and responsibilities of various state agencies. For example, a marked difference is apparent in regard to the local communication network concerning hurricane preparation; residents in Wrightsville Beach were clearly more in touch with state officials before Hurricane Bonnie and responded to the advice given. In view of these initial results, the detailed network of local emergency management services must be mapped. Further, more in-depth interviews will be carried out with two groups; residents of Wrightsville Beach and Topsail Island, and local response managers. Questions will be geared toward an understanding of the diverse social structures within which these individuals are embedded, and the production of particular practical knowledge concerning FEMA.

Ironically, the clearest differences between the two communities are the result of activities organized at the local level. Yet, most respondents consider FEMA in a negative light; from the comments noted in our survey, this attitude would appear to be related to their experiences with FEMA in relation to Hurricane Fran, as well as a generally negative view of federal-level bureaucracy. Judging from the surveys alone, there is no indication that changes in the policies and operation of FEMA since Fran have entered into public knowledge. Such a conclusion does, however, warrant further investigation.

REFERENCES

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1. This research is part of a larger project that seeks to understand the diverse, intersecting processes, both physical and social, that are responsible for the production of a "hurricane hazard" in the Outer Banks area of eastern North Carolina.

HURRICANE BONNIE QUESTIONNAIRE

Q-1 Study site _____

Q-2 Property location

1 DIRECTLY ON THE WATERFRONT
2 ON THE WATERFRONT, BEHIND A DUNE FORMATION
3 NON-WATERFRONT, BUT WITHIN 1000 FEET
4 BEYOND 1000 FEET

Q-3 How long have you been a resident here?

1 LESS THAN 1 YEAR
2 1 TO 4 YEARS
3 5 TO 9 YEARS
4 10 YEARS OR MORE
5 ENTIRE LIFE

Q-4 Is your residence a(n):

1 HOUSE

2 APARTMENT
3 CONDOMINIUM
4 MOBILE HOME

Q-5 Do you own this residence?

1 NO
2 YES

Q-6 What is the approximate value of your residence?

1 LESS THAN $20,000
2 20,000 TO 49,999
3 50,000 TO 79,999
4 80,000 TO 99,999
5 100,000 TO 199,999
6 OVER $199,999

Q-7 What type of property insurance did you have prior to Hurricane Bonnie?

Q-8 What type of property insurance do you have now?

Q-9 What attracted you to this area? 1 EMPLOYMENT
2 RETIREMENT
3 CLIMATE
4 I AM A NATIVE RESIDENT
5 OTHER (please indicate)
_____

Q-10 How serious is storm-related erosion and/or damage in your area?

1 EXTREMELY SERIOUS
2 VERY SERIOUS
3 SOMEWHAT SERIOUS
4 SLIGHTLY SERIOUS
5 NOT A PROBLEM

Q-11 In general, to what do you attribute this erosion? Circle all that apply.

1 INCREASING NUMBER OF STORMS
2 STRONGER STORMS
3 PAST RISES IN SEA LEVEL
4 LOSS OF BEACH SAND
5 LACK OF ADEQUATE PROTECTION ALONG THE COAST
6 OTHER (please indicate)
_____

Q-12 How many of the following have you experienced at this location?

1 HURRICANES _____
2 SEVERE COASTAL STORMS _____

Q-13 Please indicate in the spaces provided the number of times you or your family have experienced the following kinds of property damage or personal injury from coastal storms and hurricanes (NOT INCLUDING HURRICANE BONNIE).

	This location	Other location
LOSS OF LIFE (FAMILY MEMBER)	_____times	_____times
DESTRUCTION OF PROPERTY (HOUSE, CAR, BOAT, ETC.)	_____times	_____times
MAJOR DAMAGE AND/OR INJURY	_____times	_____times
MINOR DAMAGE AND/OR INJURY	_____times	_____times
EMOTIONAL DISTRESS	_____times	_____times

Q-14 If you have experienced any of the above at another location, please indicate where and why you were there.

Q-15 Are you aware of any local awareness meetings designed to educate the public about the hazards associated with hurricanes?

1 YES
2 NO (Please skip to Question 19)

Q-16 Have you participated in any of those meetings?

1 NEVER (Please skip to Question 19)
2 ONCE
3 REGULARLY

Q-17 Did you find those meetings to be useful?

1 YES
2 NO

Q-18 Why or why not?

Q-19 Are you aware of any informational literature designed to educate the public about the hazards associated with hurricanes?

1 YES
2 NO (Please skip to Question 22)

Q-20 Did you find the literature to be useful?

1 YES
2 NO

Q-21 Why or why not? **Q-22** Please list any other methods by which you have received information on hurricanes hazards.

Q-23 Through what means did you FIRST receive information about Hurricane Bonnie?

1 TELEVISION
2 RADIO
3 NEWSPAPER
4 WORD OF MOUTH
5 OTHER (Please explain)

Q-24 How far in advance of the hurricane's arrival did you receive the information?

Q-25 What type of information did you receive?

1 PREPARATION
2 EVACUATION
3 RECONSTRUCTION

4 OTHER (Please explain)

Q-26 Which agency(ies) is/are responsible for providing the initial warning of a potential hurricane hazard?

1 LOCAL EMERGENCY SERVICES (POLICE, FIRE, RESCUE)
2 NATIONAL WEATHER SERVICE
3 OTHER (Please explain)

Q-27 Were you satisfied with this warning service during Hurricane Bonnie?

1 YES
2 NO (Please explain)

Q-28 Which government agency(ies) is/are responsible for organizing the response efforts prior to a potential hurricane hazard?

1 LOCAL EMERGENCY MANAGEMENT OFFICE
2 LOCAL EMERGENCY SERVICES (POLICE, FIRE, RESCUE)
3 OTHER (Please indicate)

Q-29 Were you satisfied with these efforts during Hurricane Bonnie? 1 YES
2 NO (Please explain)

Q-30 Did you evacuate the area prior to Hurricane Bonnie?

1 YES
2 NO (Please skip to Question 37)

Q-31 What efforts did you undertake to prepare your residence for Hurricane Bonnie?

Q-32 What persuaded you to evacuate the area?

Q-33 To which location did you evacuate?

Q-34 When were you permitted to return to your residence?

Q-35 Which of the following did you experience as a result of Hurricane Bonnie?

0 NO ADVERSE EFFECTS
1 LOSS OF LIFE (FAMILY MEMBER)
2 DESTRUCTION OF PROPERTY (HOUSE, CAR, BOAT, ETC.)
3 MAJOR DAMAGE AND/OR INJURY
4 MINOR DAMAGE AND/OR INJURY
5 EMOTIONAL DISTRESS

Q-36 Do you feel you should have done more to prepare your residence for Hurricane Bonnie?

1 YES
2 NO

Please explain your answer.
(Please skip to Question 41)

Q-37 What persuaded you to stay in the area during Hurricane Bonnie?

Q-38 What efforts did you undertake to prepare for Hurricane Bonnie?

Q-39 Which of the following did you experience as a result of Hurricane Bonnie?

0 NO ADVERSE EFFECTS
1 LOSS OF LIFE (FAMILY MEMBER)
2 DESTRUCTION OF PROPERTY (HOUSE, CAR, BOAT, ETC.)
3 MAJOR DAMAGE AND/OR INJURY
4 MINOR DAMAGE AND/OR INJURY
5 EMOTIONAL DISTRESS

Q-40 Do you feel you should have done more to prepare for the hurricane?

1 YES
2 NO

Please explain your answer.

Q-41 Were you aware of the Federal Emergency Management Agency (FEMA) prior to Hurricane Bonnie?

1 YES
2 NO
(Please skip to Question 46)

Q-42 Through what means did you receive information regarding FEMA?

1 TELEVISION
2 RADIO
3 NEWSPAPER
4 WORD OF MOUTH
5 COMMUNITY BULLETINS
6 INFORMATIONAL LITERATURE
7 OTHER (Please explain)

Q-43 What type of information did you receive?

1 INFORMATION ON NATIONAL FLOOD INSURANCE PROGRAM (NFIP)
2 INFORMATION ON CLEANUP AND RECONSTRUCTION EFFORTS
3 GENERAL INFORMATION ON NATURAL HAZARDS

Q-44 Did you receive aid from FEMA after Hurricane Bonnie?

1 YES (Please explain)
2 NO (Please skip to Question 51)

Q-45 Were you satisfied with this aid?

1 YES (Please skip to Question 51)
2 NO (Please explain)

Q-46 Did you become aware of FEMA after Hurricane Bonnie?

1 YES
2 NO (Please skip to Question 51)

Q-47 Through what means did you receive information regarding FEMA?

1 TELEVISION
2 RADIO
3 NEWSPAPER
4 WORD OF MOUTH 5 COMMUNITY BULLETINS
6 INFORMATIONAL LITERATURE
7 OTHER (Please explain)

Q-48 What type of information did you receive?

1 INFORMATION ON NATIONAL FLOOD INSURANCE PROGRAM (NFIP)
2 INFORMATION ON CLEANUP AND RECONSTRUCTION EFFORTS
3 GENERAL INFORMATION ON NATURAL HAZARDS

Q-49 Did you receive aid from FEMA after Hurricane Bonnie?

1 YES (Please explain)
2 NO (Please skip to Question 51)

Q-50 Were you satisfied with this aid?

1 YES
2 NO (Please explain)

Q-51 In your opinion, how effective were the following levels of government at dealing with Hurricane Bonnie? Check one for each level of government.

	Very Effective	Somewhat Effective	Not Effective	Don't Know
Federal (U.S.)	____	____	____	____
State (North Carolina)	____	____	____	____
County/Municipal	____	____	____	____

Please answer the following questions about yourself. This information will help to interpret the results of this questionnaire.

Q-52 Please indicate your sex.

1 MALE
2 FEMALE

Q-53 What is your present age? _____ YEARS

Q-54 Indicate the age and sex of each person in your household. Please include yourself.

AGE	SEX (M or F)	AGE	SEX (M or F)
____	_____	____	_____
____	_____	____	_____
____	_____	____	_____
____	_____	____	_____

Q-55 Are you currently employed, unemployed or retired?

1 EMPLOYED (Please indicate occupation.)
_____
2 CURRENTLY UNEMPLOYED
3 RETIRED

Q-56 What was your approximate annual household income in 1995?

1 LESS THAN $10,000
2 10,000 TO 29,999
3 30,000 TO 49,999
4 50,000 TO 69,999
5 70,000 TO 89,999
6 OVER $89,999

Q-57 Please indicate how many years of school you have completed and if you hold a college degree.

_____YEARS OF EDUCATION
COLLEGE DEGREE? (yes or no) _____

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September 13, 1999

hazctr@colorado.edu