Chapter 7

Public Response to Hurricane Floyd

In the Beaufort, South Carolina Vicinity

Prepared by Earl J. Baker - Hazards Management Group, Inc.

Survey Method

Approximately 600 telephone interviews were conducted in southern South Carolina region, including the coastal counties of Beaufort, Jasper, and Colleton. The sample was stratified as follows:

- 1. 200 interviews in areas at risk to storm surge in category 1 hurricanes
- 2. 200 interviews in areas at risk to storm surge in stronger hurricanes
- 3. 100 interviews in areas of coastal counties not subject to inundation by storm surge
- 4. 100 interviews in non-coastal counties adjacent to the coastal counties.

Evacuation zones defined in the most recent hurricane evacuation study for the region were used to identify the sampling areas. A copy of the generic questionnaire used in post-Floyd surveys is included as Appendix I.

Statistical Reliability

Figures reported from surveys cited in this report are based upon samples taken from larger populations. The sample values provide estimates of the values of the larger populations from which the samples were selected, but usually are not precisely the same as the true population values. In general, the larger the number of people in the sample, the closer the sample value will be to the true population value. A sample of 200 will provide estimates which one can be 90% “confident” are within 4 to 6 percentage points of the true populations values, whereas a sample of 100 will provide the same degree of confidence of being within 5 to 8 percentage points of the true population values. With a sample of 50, one can be 90% "confident" of being within 7 to 11 percentage points of the actual population value, and a sample of 25 is 90% "accurate" only within 10 to 17 percentage points. With a sample of 50, one can be 90% "confident" of being within 7 to 12 percentage points of

the actual population value. A sample of 25 is 90% "accurate" only within 10 to 17 percentage points.

The ranges (e.g., "10 to 17") stem from the fact that the reliability of an estimate depends not only on the size of the sample but also upon how much agreement there is among the responses. Having 90% of the respondents give a particular answer means almost everyone agreed. By the same reasoning, if only 10% gave a particular response, almost everyone agreed (i.e., 90% disagreed with the 10% but agreed with one another). The maximum disagreement is for the responses to be split 50-50. Thus, if 90% (or 10%) of a sample of 100 give a particular response, that estimate will be within 5 percentage points of the true population value 90% of the time. If 75% (or 25%) of a sample of 100 give a particular response, that estimate will be within 7 percentage points 90% of the time. If 50% of a sample of 100 give a particular response, that estimate will be within 8 percentage points 90% of the time.

Therefore, readers should keep in mind that some estimates provided in this report are more statistically reliable than others. This is particularly noteworthy in drawing conclusions about whether two survey results are "different" from one another. Differences of a few percentage points in sample results of 100 or less do not necessarily mean the populations from which the samples were drawn are different. When the aggregate samples are broken down into subgroups, the reliability of estimates for the subgroups suffers. Tables contain actual sample sizes used to calculate the values reported in the table. Sample sizes vary from table to table because not all questions were asked of all respondents (people who didn't evacuate weren't asked where they went, for example), some respondents refused to answer some questions, and in a few cases responses were invalid. There are so few respondents in certain risk zones for some questions that the results are not useful for generalizations. They are included solely for completeness.

In nearly all tables, data refer to percentages of respondents. In some questions respondents could give more than one answer, resulting in totals exceeding 100%.

Evacuation Participation Rates

Evacuation, as used in the survey, refers to leaving one's home to go someplace safer. In the category 1 risk zone, almost 90% evacuated, as did 80% in other surge zones and 64% from non-surge areas (Table 1). The "shadow" evacuation in non-coastal counties (i.e., evacuation from areas not told by officials to evacuate) was substantial, contributing to the evacuating traffic.

Table 1. Percent who left their homes in Floyd, by risk zone

	Cat 1 Surge Zone N=198	Other Surge Zones N=198	Coastal Non-surge N=106	Non-coastal Counties N=106
Evacuated	88	80	64	26

Most of the residents who did not evacuate gave the same reason: they felt their home would be safe enough, given their beliefs about the likely track and strength of the storm (Table 2). Traffic deterred some from leaving, and in the "other" surge zone, 10% of the stayers said they tried to evacuate and gave up.

Table 2. Why Stayed (Percent of Respondents)

	Cat 1 Surge Zone N=22	Other Surge Zones N=40	Coastal County Non-Surge N=38	Non-coastal Counties N=72
House OK for Storm	36	30	40	57
Officials Said Stay				7
Media Said Stay	5	5		8
Friends Said Stay	5			10
Officials Didn't Say Leave	5	3	8	21
Probabilities Low	14	13	29	36
Other Info. Would Miss	55	8	16	14
No Transport		3	3	1

No Place to Go	14	5	3	

Table 2. Why Stayed (Percent of Respondents) continued

Protect from Looters		3		
Protect from Storm	5		3	4
Left in Past Miss	14	10	5	1
Job	9	13	16	7
Waited Too Long			3	1
Traffic	9	25	13	3
Tried, Gave Up		10		
Dangerous on Road				
Pets		3		1
Required Medical Care		3	5	1
Other	9	8	21	10
Don’t Know	9			3

Jobs were mentioned by some, and respondents were asked specifically whether anyone in their household had to work during Floyd and how that affected their evacuation (Tables 3, 4). Approximately a fourth said someone in the household had to work, and some said it either prevented part of the household from evacuating or delayed their departure.

Table 3. Someone in Household Had to Work in Floyd

	Cat 1 Surge Zone N=198	Other Surge Zones N=198	Coastal County Non-surge N=106	Non-coastal Counties N=105
Yes	21	22	19	29
No	79	78	81	71

Table 4. How Work Affected Evacuation in Floyd

	Cat 1 Surge Zone N=41	Other Surge Zones N=44	Coastal County Non-surge N=20	Non-coastal Counties N=30
None	49	34	65	53
Kept All from Leaving	2	16	10	20
Kept Part from Leaving	5	14	0	10
Delayed All in Leaving	29	27	15	3
Delayed Part in Leaving	12	9	10	0
Other	2	0	0	13

Those who didn't evacuate were asked whether they would have left had they been convinced the storm was going to strike, and more than half said they would have (Table 5). Most also said they had made the necessary preparations to leave in case conditions worsened (Table 6).

Table 5. Stayers Who Say They Would Have Left If Convinced Storm Was Going to Hit

	Cat 1 Surge Zone N=21	Other Surge Zones N=40	Coastal County Non-surge N=38	Non-coastal Counties N=78
Would Have Left	57	63	58	68
Wouldn't Have Left	38	28	37	27
Don't Know	5	10	5	5

Table 6. Stayers Who Say They Had Made Necessary Preparations to Leave

	Cat 1 Surge Zone N=22	Other Surge Zones N=40	Coastal County Non-surge N=38	Non-coastal Counties N=78
Had Prepared	64	78	63	69
Hadn't Prepared	36	23	29	31
Don't Know	0	0	3	0

Evacuees were asked what convinced them to leave, and most indicated some combination of response to actions by public officials, media recommendations, and concern about storm conditions (Table 7.)

Table 7. Why Left (Percent of Respondents)

	Cat 1 Surge Zone N=174	Other Surge Zones N=158	Coastal County Non-surge N=66	Non-coastal Counties N=27
Officials Said Leave	31	29	23	15
NWS Said Leave	23	11	38	26
Police/Fire Said Leave	8	8	9	4
Media Said Leave	25	22	32	26
Friend Said Leave	12	15	20	15
Storm Severe	34	30	29	48
Heard “Bad as Hugo/Andrew”	8	12	9	
Increased in Strength	4	1	5	
Concerned about Flooding	10	6	5	
Concerned about Winds	14	13	11	22
Concerned re. Road Flooding	1	1		
Probability of Hit	16	27	8	25
Post-Storm Concerns	1	1		
Other	18	16	8	15
Don’t Know	1	2		

In an attempt to separate the effect of messages disseminated by government officials via the media from the effect of other information heard via the media, respondents were asked which had the greater impact on their decision to evacuate. In category 1 surge areas information from government and media had comparable impacts (Table 8). In other risk zones information from officials had the greater effect.

Table 8. Greatest Influence to Leave (Percent of Respondents)

	Cat 1 Surge Zone N=174	Other Surge Zones N=157	Coastal County Non-surge N=67	Non-coastal Counties N=26
Media Info from Gov't Officials	43	50	54	65
Other Media Info	45	30	43	54
Info from Friends	12	16	16	8
Other	12	13		8
Don't Know	1	1	2	

Interviewees were also asked whether they heard from officials – either directly or indirectly – that they should evacuate. Between 60% and 70% in coastal counties said they did (Table 9). In non-coastal counties and outside of surge zones, people who heard evacuation notices were more likely than others to evacuate, particularly if they believed the notice to be mandatory (Table 10). The effect was more pronounced in non-surge areas.

Table 9. Heard Evacuation Notices from Officials

	Cat 1 Surge Zone N=199	Other Surge Zones N=198	Coastal County Non-Surge N=106	Non-coastal Counties N=105
Heard Notice	69	68	61	31
Didn't Hear	27	32	34	68
Don't Know	4	0	5	2

Table 10. Evacuation Participation Rates, by Hearing Evacuation Notices from Officials (Sample sizes vary by cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Heard Must	96	86	85	71
Heard Should	81	62	50	52
Didn't Hear	85	79	53	11

Few people in the coastal counties (or even in adjacent non-coastal counties) believe they would be safe in a 125 MPH hurricane in their own homes (Table 11a). In all four risk zones people who perceived their homes to be vulnerable were substantially more likely than others to evacuate (Table 11b).

Table 11a. Perceived Safety of Home from Wind and Water in 125 MPH Hurricane

	Cat 1 Surge Zone N=199	Other Surge Zones N=198	Coastal County Non-Surge N=106	Non-coastal Counties N=105
Safe	10	23	18	31

Unsafe	80	65	69	53
Don't Know	11	12	13	15

Table 11b. Evacuation Participation Rates, by Perceived Safety in 125 MHP Storm (See previous table for sample sizes for each cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Safe	68	63	42	18
Unsafe	91	87	73	29
Don't Know	91	75	50	31

Evacuation Timing

Evacuation departures were fairly gradual, primarily during September 14 and 15, with the steepest portion of the response on the 14th. Half of the eventual evacuees had left by noon on the 14th , and 80% had left by the end of the 14th. A hurricane watch was issued for the area at 11 PM on the 13th, followed by a warning at 5 PM on the 14th.

Use of Public Shelters and Other Refuges

The great majority of evacuees went to the homes of friends and relatives or to hotels and motels (Table 12). Five percent or fewer of those interviewed said they went to public shelters.

Table 12. Refuges Uses by Evacuees

	Cat 1 Surge Zone N=173	Other Surge Zones N=152	Coastal County Non-Surge N=66	Non-coastal Counties N=25
Public Shelter	1	2	5	4

Church	1	1	2	
Friend/Relative	43	55	52	72
Hotel/Motel	51	35	36	16
Workplace	1	1		
Other	4	6	6	8

Evacuation Destinations and Transportation Issues

Almost all evacuees from coastal counties left their county, not surprising since entire counties were told to evacuate (Table 13). Even in non-coastal counties 68% left their county. More evacuees went to Georgia than any other state, including South Carolina (Table 14).

Table 13. Percent of evacuees by destination, by risk zone

	Cat 1 Surge Zone N=174	Other Surge Zones N=155	Coast Non-Surge N=68	Non-Coastal Counties N=28
Own Neighborhood	0	0	3	21
Own County	2	1	3	11
Out of County	98	99	94	68

Table 14. Percent of out-of-county evacuees, by state destination

Florida	1
Georgia	43

South Carolina	35
North Carolina	13
Virginia	1
Alabama	2
Tennessee	3
Other	2

Going out of county was motivated by three main factors: the strength of the storm, the location of friends and family, and the lack of closer motels (Table 15). In category 1 surge areas information from government officials conveyed by the media had about the same influence as other media information (Table 16). In other risk areas the relative influence of government information varied.

Table 15. Why Went Out of County

	Cat 1 Surge Zone N=170	Other Surge Zone N=155	Coastal County Non-surge N=63	Non-coastal Counties N=19
Strength of Storm	32	21	22	21
Previous Hurri-cane Experience	8	5	16	
Comparisons to Hugo/Andrew	1	6	6	
Officials Said Leave County	5	7	2	
Media Said Leave County	7	7	8	5
Friend Said Leave County	5	10	19	5
Friend Lives in Destination	36	47	48	63
No Public Shelter Closer	4	3	3	
No Motels Closer	28	25	24	11
Other	18	9	3	16
Don’t Know	1	3		

Table 16. Greatest Influence for Going Out of County

	Cat 1 Surge Zone N=171	Other Surge Zones N=154	Coastal County Non-surge N=63	Non-coastal Counties N=19
Media Info from Gov't Officials	37	44	38	32
Other Media Info	37	28	46	53
Info from Friends	17	23	21	21
Other	19	12	10	5
Don't Know	1	1	0	0

Over 85% of the evacuees eventually reached their destinations (Table 17). New destinations were about as likely to be farther than originally planned as closer (Table 18). Traffic, location of refuge, and fatigue were the main reasons cited for changing destinations (Table 19).

Table 17. Whether Reached Original Destination

	Cat 1 Surge Zone N=175	Other Surge Zones N=158	Coastal County Non-surge N=68	Non-coastal Counties N=27
Yes	87	85	90	89
No	10	15	9	11
Don't Know	3	1	1	0

Table 18. Proximity of New Destination, Compared to Original Destination

	Cat 1 Surge Zone N=18	Other Surge Zones N=22	Coastal County Non-surge N=6	Non-coastal Counties N=3
Farther	72	36	67	33
Closer	28	55	17	67
Same		9	17	
Don't Know				

Table 19. Why Changed Destination

	Cat 1 Surge Zone N=16	Other Surge Zones N=23	Coastal County Non-surge N=6	Non-coastal Counties N=3
Traffic	13	35	17	67
Better Route				
Loc. of Refuge	25	29	50	
Out of Gas		4		
Tired	31	17	17	
Hungry	6			
Bathroom				
Storm Strengthened				33
Storm Close	13			
Other	50	35	33	
Don't Know		4		

Most people said they did not hear about traffic problems on evacuation routes before leaving home (Table 20). Of those who heard about such problems before leaving home, most did not change their evacuation route plans, although 30% to 40% did (Table 21).

Table 20. Heard About Evacuation Route Problems Before Leaving Home

	Cat 1 Surge Zone N=175	Other Surge Zones N=158	Coastal County Non-surge N=68	Non-coastal Counties N=27
Yes	36	39	40	48
No	62	60	57	52
Don't Know	2	1	3	0

Table 21. Changed Routes Because of Information Heard Before Leaving Home

	Cat 1 Surge Zone N=62	Other Surge Zones N=61	Coastal County Non-surge N=27	Non-coastal Counties N=13
Yes	40	30	30	39
No	60	70	63	61

Those who said they had heard about evacuation problems before leaving home were also asked whether they heard about such problems after leaving home. Most said they did (Table 22). In coastal areas 22% to 38% said they changed their route plans accordingly (Table 23).

Table 22. Heard About Evacuation Route Problems After Leaving Home

	Cat 1 Surge Zone N=61	Other Surge Zone N=60	Coastal County Non-surge N=27	Non-coastal Counties N=13
Yes	74	75	63	62
No	25	25	37	39
Don't Know	2	0	0	0

Table 23. Changed Routes Because of Information Heard After Leaving Home

	Cat 1 Surge Zone N=45	Other Surge Zones N=45	Coastal County Non-surge N=17	Non-coastal Counties N=7
Yes	38	22	24	0

No	62	78	76	100

Most evacuees from surge areas used interstate highways for at least part of their evacuation (Table 24). Not all of those who used interstates in Floyd were inclined to use them again (Table 25). The majority of the respondents said they were familiar with the roads in the area through which they evacuated (Table 26). More than three-fourths also said they would be willing to use a different route than they would normally use if government officials urged them to do so to avoid congestion, even if the route took them out of their way (Table 27).

Table 24. Used Interstate for at Least Part of Route

	Cat 1 Surge Zone N=175	Other Surge Zones N=158	Coastal County Non-surge N=68	Non-coastal Counties N=27
Yes	62	61	49	22
No	37	37	49	78
Don't Know	1	1	2	0

Table 25. Routes to be Used in the Future

	Cat 1 Surge Zone N=108	Other Surge Zones N=97	Coastal County Non-surge N=33	Non-coastal Counties N=6
Interstate	28	34	30	33
Secondary Roads	27	34	27	0
Both	30	19	21	50
Depends on Traffic	5	7	12	17
Depends on Other	8	3	6	0
Other	1	2	0	0
Don't Know	2	1	3	0

Table 26. Familiar with Roads in Area

	Cat 1 Surge Zone N=174	Other Surge Zones N=157	Coastal County Non-surge N=68	Non-coastal Counties N=27
Yes	71	65	77	89
No	28	33	19	11
Don't Know	1	3	4	0

Table 27. Would Use Routes Advised by Officials, Even if Longer

	Cat 1 Surge Zone N=175	Other Surge Zones N=158	Coastal County Non-surge N=68	Non-coastal Counties N=27
Yes	77	75	81	85
No	6	9	2	4
Depends How Much Longer	3	8	0	4
Depends on Other	9	4	99	4
Other	1	1	0	0
Don't Know	4	4	9	4

More than half the respondents said it took them five or more hours to reach their destination and many said it took more than 10 hours (Table 28). Times were longer than expected (Table 29). When asked how long it was reasonable for an evacuation like Floyd's to take, most respondents gave times shorter than the actual evacuation but slightly longer than their original expectation (Table 30).

Table 28. Hours Required to Reach Destination

	Cat 1 Surge Zone N=170	Other Surge Zones N=155	Coastal County Non-surge N=68	Non-coastal Counties N=25
Less than 2	9	5	22	40
2 to 5	28	19	25	28
5 to 10	34	39	38	32
10 or more	29	37	15	0
Mean No. Hrs	8	8.9	6.7	3.7
Median No. Hrs	6.5	9.0	6.0	4.0

Table 29. Hours Expected to Reach Destination

	Cat 1 Surge Zone N=165	Other Surge Zones N=143	Coastal County Non-surge N=61	Non-coastal Counties N=26
Less than 2	12	20	33	58

2 to 5	61	57	41	31
5 to 10	24	22	26	12
10 or more	4	1	0	0
Mean No. Hrs	4.7	4.3	3.8	2.6
Median No. Hrs	4.0	4.0	4.0	1.8

Table 30. Hours Reasonable to Reach Destination

	Cat 1 Surge Zone N=154	Other Surge Zones N=137	Coastal County Non-surge N=57	Non-coastal Counties N=25
Less than 2	10	10	30	
2 to 5	46	37	25	
5 to 10	42	50	42	
10 or more	3	2	4	
Mean No. Hrs	5.4	5.4	4.6	3.1
Median No. Hrs	5.0	6.0	5.0	2.5

Most people thought the traffic delays were caused mainly by the sheer volume of traffic, the fact that too many people left at once, and poor management (Table 31). Some also advocated reversing lane directions. More than 70% of the respondents said they would be willing to cooperate in a phased evacuation in which they would delay their departure for a few hours until people in a more dangerous location had begun their evacuation (Table 32).

Table 31. Why Traffic Was Slow

	Cat 1 Surge Zone N=175	Other Surge Zones N=158	Coastal County Non-surge N=68	Non-coastal Counties N=27
Number of Cars	51	53	59	56
All Left at Once	45	42	32	37
Waited too Long	18	11	22	7
Construction	1	3	0	4
Accidents	4	3	7	4
Poor Traffic Management	25	36	29	33
Need Reverse Lanes	22	19	12	7
Bad Weather	1	1	0	4
Other	14	10	7	4
Don’t Know	13	11	12	22

Table 32. Would Delay Departure if Urged by Officials

	Cat 1 Surge Zone N=198	Other Surge Zones N=198	Coastal County Non-surge N=106	Non-coastal Counties N=104
Yes	73	76	86	87
Depends on Storm's Proximity	8	3	4	2
Depends on Storm's Strength	2	6	1	0
Other	6	1	2	3
Don't Know	6	6	5	6
No	7	9	3	3

Most evacuees did not cite specific difficulties experienced during the evacuation. Needing restroom facilities was most common, while others ran out of gas, had mechanical breakdowns, and needed food (Table 33). Almost half of the evacuees said they heard about places where they could find shelter if they weren't able to reach their destinations (Table 34). Few changed their plans about seeking shelter as a result (Table 35). Most interviewees reported no difficulties when returning from the evacuation (Table 36).

Table 33. Difficulties Experienced in Evacuation

	Cat 1 Surge Zone N=175	Other Surge Zones N=158	Coastal County Non-surge N=68	Non-coastal Counties N=27
Ran Out of Gas	1	2	0	0
Car Broke Down	1	3	0	0
Needed Water	1	3	0	0
Needed Food	5	5	0	0
Needed Restroom	14	22	4	4
Other Difficulties	5	4	0	0
No Difficulties	83	75	96	96

Table 34. Heard About Refuge Options After Leaving Home

	Cat 1 Surge Zone N=175	Other Surge Zones N=158	Coastal County Non-surge N=68	Non-coastal Counties N=26
Yes	41	42	38	42
No	57	57	59	54
Don't Know	3	1	3	4

Table 35. Changed Plans Because of Refuge Information Heard After Leaving Home

	Cat 1 Surge Zone N=68	Other Surge Zones N=67	Coastal County Non-surge N=26	Non-coastal Counties N=11
Yes	2	0	8	0
No	98	100	92	100

Table 36. Difficulties Experienced Returning from Evacuation

	Cat 1 Surge Zone N=175	Other Surge Zones N=158	Coastal County Non-surge N=68	Non-coastal Counties N=27
Lack of Information	1	1	0	0

Roads Blocked by Water/Debris	2	1	1	0
Traffic Congested	7	5	4	15
Re-entry Not Permitted	0	2	0	0
Other Difficulties	1	1	0	0
No Difficulties	90	91	94	85

Vehicle use was typical of most evacuations, in which 65% to 75% of the available vehicles are used (Table 37). Few households required assistance in evacuating, and in most instances outside agencies were not required (Table 38).

Table 37. Vehicle Use by Evacuating Households

	Cat 1 Surge Zone N=175	Other Surge Zones N=158	Coastal County Non-surge N=68	Non-coastal Counties N=27
Percent of Available	72	76	70	64
Avg. Number Per Household	1.3	1.48	1.32	1.26
Pulled Trailer, Took Motorhome	2.5	5.3	4.6	3.7

Table 38. Required Assistance in Evacuating (As a Percent of All Households)

	Cat 1 Surge Zone N=174	Other Surge Zones N=158	Coastal County Non-surge N=68	Non-coastal Counties N=0
Yes, Within Household	3	3	3	
Yes, Friend/ Relative	0	3	3	
Yes, Agency	3	1	3	
No	94	94	94	

Local television and The Weather Channel were relied upon most heavily by the respondents for information about Floyd, followed by local radio (Table 39). CNN was the next most relied-upon source of information.

Table 39. Sources Relied On a Great Deal for Information about Floyd

	Cat 1 Surge Zone N=198	Other Surge Zones N=197	Coastal County Non-surge N=104	Non-coastal Counties N=105
Local Radio	26	34	29	40
Local Television	63	62	76	76
CNN	14	24	18	30

Weather Channel	61	60	61	62
Other Cable	4	7	0	6
Internet	5	12	4	6
AOL	2	3	2	1
Word of Mouth	17	14	9	13

Of those who said they would do anything differently if faced with the same circumstances again as in Floyd, leaving ealier was the most common change (Table 40). Some who left wouldn't, but some who didn't leave would.

Table 40. Would Do Differently Next Time

	Cat 1 Surge Zone N=197	Other Surge Zones N=197	Coastal County Non-surge N=105	Non-coastal Counties N=105
Would Leave	3	3	5	5
Wouldn't Leave	9	11	8	7
Leave Earlier	24	32	21	7
Leave Later	9	10	4	2
Go Farther	4	1	1	0

Go Closer	5	3	4	2
Use Public Shelter	0	1	1	1
Not Use Pub Shltr	1	0	0	0
Different Route	7	4	4	0
Buy Gasoline	0	1	0	0
Take Provisions	2	3	0	0
Other	8	11	8	7
Don’t Know	7	6	6	11
Nothing Different	50	43	61	70

Chapter 5

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Hazards Management Group, Inc.

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The ranges (e.g., "10 to 17") stem from the fact that the reliability of an estimate depends not only on the size of the sample but also upon how much agreement there is among the responses. Having 90% of the respondents give a particular answer means almost everyone agreed. By the same reasoning, if only 10% gave a particular response, almost everyone agreed (i.e., 90% disagreed with the 10% but agreed with one another). The maximum disagreement is for the responses to be split 50-50. Thus, if 90% (or 10%) of a sample of 100 give a particular response, that estimate will be within 5 percentage points of the true population value 90% of the time. If 75% (or 25%) of a sample of 100 give a particular response, that estimate will be within 7 percentage points 90% of the time. If 50% of a sample of 100 give a particular response, that estimate will be within 8 percentage points 90% of the time.

Therefore, readers should keep in mind that some estimates provided in this report are more statistically reliable than others. This is particularly noteworthy in drawing conclusions about whether two survey results are "different" from one another. Differences of a few percentage points in sample results of 100 or less do not necessarily mean the populations from which the samples were drawn are different. When the aggregate samples are broken down into subgroups, the reliability of estimates for the subgroups suffers. Tables contain actual sample sizes used to calculate the values reported in the table. Sample sizes vary from table to table because not all questions were asked of all respondents (people who didn't evacuate weren't asked where they went, for example), some respondents refused to answer some questions, and in a few cases responses were invalid. There are so few respondents in certain risk zones for some questions that the results are not useful for generalizations. They are included solely for completeness.

In nearly all tables data refer to percentages of respondents. In some questions respondents could give more than one answer, resulting in totals exceeding 100%. Although no interviews were conducted in non-surge areas of coastal counties, tables contain a column for that category of respondents, with an indicated sample size of zero. This is done to facilitate side-by-side comparison of tables in reports from other post-Floyd study locations.

Evacuation Participation Rates

Evacuation, as used in the survey, refers to leaving one's home to go someplace safer. In the category 1 risk zone, 89% evacuated, as did 75% in other surge zones (Table 1). The "shadow" evacuation in adjacent non-coastal counties (i.e., evacuation from areas not told by officials to evacuate) was substantial, contributing to the evacuating traffic. Entire coastal counties in the region were told by officials to evacuate.

Table 1. Percent who left their homes in Floyd, by risk zone

	Cat 1 Surge Zone N=300	Other Surge Zones N=198	Coastal Non-surge N=0	Non-coastal Counties N=103
Evacuated	89	75		27

Most of the residents who did not evacuate gave the same reason: they felt their home would be safe enough, given their beliefs about the likely track and strength of the storm (Table 2). No other single reason was prominent in the responses, although traffic and past “false alarms” were a deterrents to some.

Table 2. Why Stayed (Percent of Respondents)

	Cat 1 Surge Zone N=33	Other Surge Zones N=45	Coastal County Non-Surge N=0	Non-coastal Counties N=72
House OK for Storm	33	56		64
Officials Said Stay	3	2		4
Media Said Stay	12	4		8
Friends Said Stay	3			1
Officials Didn’t Say Leave				4
Probabilities Low	27	13		32
Other Info. Would Miss	3	7		4

No Transport	0	0		0
No Place to Go	9	0		4

Table 2. Why Stayed (Percent of Respondents (continued)

Protect from Looters	3	2		0
Protect from Storm	6	3		3
Left in Past Miss	15	11		8
Job	6	13		8
Waited Too Long	0	7		1
Traffic	24	16		13
Tried, Gave Up	9	4		0
Dangerous on Road	0	0		0
Pets	6	0		0
Required Medical Care	0	0		0
Other	6	7		6
Don’t Know	0	0		6

Jobs were mentioned by some, and respondents were asked specifically whether anyone in their household had to work during Floyd and how that affected their evacuation (Tables 3, 4). Seventeen percent to 38% said someone in the household had to work, and some said it either prevented part of the household from evacuating or delayed their departure.

Table 3. Someone in Household Had to Work in Floyd

	Cat 1 Surge Zone N=303	Other Surge Zones N=198	Coastal County Non-surge N=0	Non-coastal Counties N=103
Yes	17	32		38
No	83	68		62

Table 4. How Work Affected Evacuation in Floyd

	Cat 1 Surge Zone N=51	Other Surge Zones N=63	Coastal County Non-surge N=0	Non-coastal Counties N=38
None	61	37		74
Kept All from Leaving	4	10		16

Kept Part from Leaving	6	3		3
Delayed All in Leaving	26	37		5
Delayed Part in Leaving	2	10		0
Other	2	5		3

Those who didn't evacuate were asked whether they would have left had they been convinced the storm was going to strike, and most said they would have (Table 5). Most also said they had made the necessary preparations to leave in case conditions worsened (Table 6).

Table 5. Stayers Who Say They Would Have Left If Convinced Storm Was Going to Hit

	Cat 1 Surge Zone N=34	Other Surge Zones N=50	Coastal County Non-surge N=0	Non-coastal Counties N=75
Would Have Left	59	66		72
Wouldn't Have Left	32	20		20
Don't Know	9	14		8

Table 6. Stayers Who Say They Had Made Necessary Preparations to Leave

	Cat 1 Surge Zone N=34	Other Surge Zones N=50	Coastal County Non-surge N=0	Non-coastal Counties N=75
Had Prepared	82	76		69
Hadn't Prepared	18	24		28
Don't Know	0	0		3

Evacuees were asked what convinced them to leave, and most indicated some combination of response to actions by public officials, media messages, and concern about storm conditions (Table 7.)

Table 7. Why Left (Percent of Respondents)

	Cat 1 Surge Zone N=265	Other Surge Zones N=148	Coastal County Non-surge N=0	Non-coastal Counties N=26
Officials Said Leave	37	35		12
NWS Said Leave	16	16		15
Police/Fire Said Leave	9	9		12
Media Said Leave	20	24		27
Friend Said Leave	11	6		23
Storm Severe	22	28		15

Heard “Bad as Hugo/Andrew”	3	3		8
Increased in Strength	3	2		0
Concerned about Flooding	6	3		0
Concerned about Winds	9	14		27
Concerned re. Road Flooding	1	1		0
Probability of Hit	15	10		27
Post-Storm Concerns	1	1		0
Other	4	5		8
Don’t Know	0	1		4

In an attempt to separate the effect of messages disseminated by government officials via the media from the effect of other information heard via the media, respondents were asked which had the greater impact on their decision to evacuate. Information from officials had the greater impact in the surge zone, but not in non-coastal counties, according to respondents (Table 8).

Table 8. Greatest Influence to Leave (Percent of Respondents)

	Cat 1 Surge Zone N=259	Other Surge Zones N=147	Coastal County Non-surge N=0	Non-coastal Counties N=26
Media Info from Gov’t Officials	61	51		39

Other Media Info	31	27		54
Info from Friends	14	19		15
Other	4	1		0
Don't Know	1	1		0

Interviewees were also asked whether they heard from officials – either directly or indirectly – that they should evacuate. Seventy-four percent in category 1 areas and 65% in other surge areas they did (Table 9). More than a fourth in non-coastal counties said they heard notices. Those who did hear evacuation notices were more likely than others to evacuate, if they believed the notice to be mandatory (Table 10).

Table 9. Heard Evacuation Notices from Officials

	Cat 1 Surge Zone N=303	Other Surge Zones N=198	Coastal County Non-Surge N=0	Non-coastal Counties N=103
Heard Officials	74	65		28
Didn't Hear	25	33		69
Don't Know	1	3		3

Table 10. Evacuation Participation Rates, by Hearing Evacuation Notices from Officials (Sample sizes vary by cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties

Heard Must	95	90		54
Heard Should	74	57		21
Didn't Hear	80	57		21

Few people, even those living in adjacent non-coastal counties, believe they would be safe in a 125 MPH hurricane in their own homes (Table 11a). In storm surge areas beyond the category 1 level people who perceived their homes to be vulnerable were more likely than others to evacuate (Table 11b). Within the category 1 zone, 90% left, regardless whether they thought their home was safe in a 125 MPH hurricane or not.

Table 11a. Perceived Safety of Home from Wind and Water in 125 MPH Hurricane

	Cat 1 Surge Zone N=303	Other Surge Zones N=198	Coastal County Non-Surge N=0	Non-coastal Counties N=103
Safe	22	56		24
Unsafe	70	75		59
Don't Know	8	8		8

Table 11b. Evacuation Participation Rates, by Perceived Safety in 125 MHP Storm (See previous table for sample sizes for each cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Safe	89	56		24
Unsafe	90	82		30
Don't Know	80	50		13

Evacuation Timing

Evacuation departures were fairly gradual, primarily during September 14 and 15, with the steepest portion of the response on the 14th. Nearly 80% of the evacuees had left by the end of the day on the 14th. A hurricane watch was issued for the area at 11 AM on the 13th, followed by a warning at 5 PM on the 14th.

Use of Public Shelters and Other Refuges

The great majority of evacuees went to the homes of friends and relatives or to hotels and motels (Table 12). No more than five percent of those interviewed say they went to public shelters.

Table 12. Refuges Uses by Evacuees

	Cat 1 Surge Zone N=265	Other Surge Zones N=149	Coastal County Non-Surge N=0	Non-coastal Counties N=25
Public Shelter	2	5		4
Church	2	3		0
Friend/Relative	59	64		76
Hotel/Motel	26	20		4
Workplace	1	1		4

Other	10	8		12

Evacuation Destinations and Transportation Issues

Almost all evacuees left their own county, not surprising since the entire coastal counties were told to evacuate. (Tables 13, 14). Most went to locations in Georgia.

Table 13. Percent of evacuees by destination, by risk zone

	Cat 1 Surge Zone N=261	Other Surge Zones N=149	Coast Non-Surge N=0	Non-Coastal Counties N=25
Own Neighborhood	2	4		12
Own County	3	4		0
Out of County	95	92		88

Table 14. Percent of out-of-county evacuees, by state destination

Florida	6
Georgia	83
South Carolina	2
North Carolina	2
Virginia	0
Alabama	4
Tennessee	1
Other	1

Going out of county was motivated by three main factors: the strength of the storm, the location of friends and family, and the lack of closer motels (Table 15). Information from government officials conveyed by the media had a greater influence than other media information (Table 16).

Table 15. Why Went Out of County

	Cat 1 Surge Zone N=244	Other Surge Zone N=134	Coastal County Non-surge N=0	Non-coastal Counties N=22
Strength of Storm	18	13		23
Previous Hurri-cane Experience	3	2		5
Comparisons to Hugo/Andrew	1	1		9
Officials Said Leave County	5	5		0
Media Said Leave County	3	5		0
Friend Said Leave County	10	9		0
Friend Lives in Destination	46	55		55
No Public Shelter Closer	3	7		9
No Motels Closer	23	24		14
Other	9	8		9
Don’t Know	1	0		0

Table 16. Greatest Influence for Going Out of County

	Cat 1 Surge Zone N=244	Other Surge Zones N=134	Coastal County Non-surge N=	Non-coastal Counties N=22
Media Info from Gov't Officials	48	49		46
Other Media Info	30	20		32
Info from Friends	26	34		27
Other	5	2		5
Don't Know	1	0		0

Over 80% of the evacuees from most risk areas eventually reached their destinations (Table 17). Of those who changed destinations, most went someplace closer than anticipated (Table 18). Traffic, location of refuge, and fatigue were the main reasons for changing destinations (Table 19).

Table 17. Whether Reached Original Destination

	Cat 1 Surge Zone N=264	Other Surge Zones N=150	Coastal County Non-surge N=0	Non-coastal Counties N=25
Yes	88	85		92
No	11	14		4
Don't Know	1	1		4

Table 18. Proximity of New Destination, Compared to Original Destination

	Cat 1 Surge Zone N=25	Other Surge Zones N=19	Coastal County Non-surge N=0	Non-coastal Counties N=1
Farther	56	47		0
Closer	44	42		100
Same	0	11		0
Don't Know	0	0		0

Table 19. Why Changed Destination

	Cat 1 Surge Zone N=24	Other Surge Zones N=23	Coastal County Non-surge N=0	Non-coastal Counties N=1
Traffic	54	44		0
Better Route	0	0		0
Loc. of Refuge	21	56		100
Out of Gas	0	0		0
Tired	21	17		0
Hungry	0	0		0

Bathroom	0	0		0
Storm Strengthened	8	0		0
Storm Close	0	0		0
Other	17	6		0
Don't Know	0	0		0

Most people leaving from coastal counties said they did not hear about traffic problems on evacuation routes before leaving home (Table 20). Of those who heard about such problems before leaving home, most did not change their evacuation route plans (Table 21).

Table 20. Heard About Evacuation Route Problems Before Leaving Home

	Cat 1 Surge Zone N=266	Other Surge Zones N=150	Coastal County Non-surge N=0	Non-coastal Counties N=24
Yes	33	34		58
No	66	66		42
Don't Know	1	0		0

Table 21. Changed Routes Because of Information Heard Before Leaving Home

	Cat 1 Surge Zone N=87	Other Surge Zones N=50	Coastal County Non-surge N=0	Non-coastal Counties N=14
Yes	17	34		50
No	83	66		50

Those who said they had heard about evacuation problems before leaving home were also asked whether they heard about such problems after leaving home. Most coastal evacuees said they did (Table 22). Most who heard, however, did not change their route plans accordingly (Table 23).

Table 22. Heard About Evacuation Route Problems After Leaving Home

	Cat 1 Surge Zone N=87	Other Surge Zone N=50	Coastal County Non-surge N=0	Non-coastal Counties N=14
Yes	63	68		21
No	37	32		71
Don’t Know	0	0		0

Table 23. Changed Routes Because of Information Heard After Leaving Home

	Cat 1 Surge Zone N=54	Other Surge Zones N=34	Coastal County Non-surge N=0	Non-coastal Counties N=3
Yes	22	18		33
No	78	82		67

Most evacuees did not use interstate highways for even part of their evacuation (Table 24). Those who used interstates in Floyd were inclined to use them again (Table 25). The great majority of the respondents said they were familiar with the roads in the area through which they evacuated (Table 26). More than three-fourths also said they would be willing to use a different route than they would normally use if government officials urged them to do so to avoid congestion, even if the route took them out of their way (Table 27).

Table 24. Used Interstate for at Least Part of Route

	Cat 1 Surge Zone N=267	Other Surge Zones N=150	Coastal County Non-surge N=0	Non-coastal Counties N=25
Yes	45	33		24
No	53	67		76
Don’t Know	2	1		0

Table 25. Routes to be Used in the Future

	Cat 1 Surge Zone N=118	Other Surge Zones N=49	Coastal County Non-surge N=0	Non-coastal Counties N=6
Interstate	49	53		50
Secondary Roads	23	20		17
Both	14	16		33
Depends on Traffic	5	6		0
Depends on Other	3	4		0
Other	2	0		0
Don't Know	3	0		0

Table 26. Familiar with Roads in Area

	Cat 1 Surge Zone N=267	Other Surge Zones N=150	Coastal County Non-surge N=0	Non-coastal Counties N=26
Yes	80	79		85
No	19	21		15
Don't Know	1	1		0

Table 27. Would Use Routes Advised by Officials, Even if Longer

	Cat 1 Surge Zone N=266	Other Surge Zones N=149	Coastal County Non-surge N=0	Non-coastal Counties N=25
Yes	77	81		84
No	5	7		12
Depends How Much Longer	4	5		0
Depends on Other	8	6		0
Other	0	0		0
Don't Know	6	1		4

Most respondents said it took them five or more hours to reach their destination (Table 28), and times were longer than expected (Table 29). When asked how long it was reasonable for an evacuation like Floyd's to take, most respondents gave times shorter than the actual evacuation but slightly longer than their original expectation (Table 30).

Table 28. Hours Required to Reach Destination

	Cat 1 Surge Zone N=256	Other Surge Zones N=144	Coastal County Non-surge N=0	Non-coastal Counties N=25
Less than 2	21	14		44
2 to 5	23	22		40
5 to 10	44	40		16
10 or more	12	24		0
Mean No. Hrs	6.2	7.3		3.2
Median No. Hrs	6	7		3

Table 29. Hours Expected to Reach Destination

	Cat 1 Surge Zone N=253	Other Surge Zones N=139	Coastal County Non-surge N=0	Non-coastal Counties N=24
Less than 2	32	35		58
2 to 5	50	45		29
5 to 10	17	18		13
10 or more	1	3		0
Mean No. Hrs	3.5	3.8		2.5

Median No. Hrs	3.5	3.5		2.0

Table 30. Hours Reasonable to Reach Destination

	Cat 1 Surge Zone N=229	Other Surge Zones N=124	Coastal County Non-surge N=0	Non-coastal Counties N=22
Less than 2	27	20		41
2 to 5	47	44		41
5 to 10	25	32		18
10 or more	1	4		0
Mean No. Hrs	4.1	4.9		3.0
Median No. Hrs	4.0	4.5		3.0

Most people thought the traffic delays were caused mainly by the sheer volume of traffic, the fact that too many people left at once, and poor traffic management (Table 31). Some advocated reversing lane directions. More than 80% of the respondents said they would be willing to cooperate in a phased evacuation in which they would delay their departure for a few hours until people in a more dangerous location had begun their evacuation (Table 32).

Table 31. Why Traffic Was Slow

	Cat 1 Surge Zone N=267	Other Surge Zones N=148	Coastal County Non-surge N=0	Non-coastal Counties N=45
Number of Cars	50	58		44
All Left at Once	43	55		44
Waited too Long	13	16		28
Construction	1	1		4
Accidents	1	3		0
Poor Traffic Management	32	30		20
Need Reverse Lanes	6	5		0
Bad Weather	0	0		0
Other	8	3		28
Don’t Know	14	6		12

Table 32. Would Delay Departure if Urged by Officials

	Cat 1 Surge Zone N=302	Other Surge Zones N=195	Coastal County Non-surge N=0	Non-coastal Counties N=103
Yes	81	86		92
Depends on Storm's Proximity	3	1		1
Depends on Storm's Strength	3	3		0
Other	0	0		0
Don't Know	5	5		5
No	8	6		4

Most evacuees did not cite specific difficulties experienced during the evacuation. Needing restroom facilities was most common, but some had mechanical breakdowns or needed food or water (Table 33). Nearly half of the evacuees said they heard about places where they could find shelter if they weren't able to reach their destinations (Table 34). Few changed their plans about seeking shelter as a result (Table 35). Hardly any interviewees reported difficulties when returning from the evacuation (Table 36).

Table 33. Difficulties Experienced in Evacuation

	Cat 1 Surge Zone N=267	Other Surge Zones N=150	Coastal County Non-surge N=	Non-coastal Counties N=25
Ran Out of Gas	0	1		0
Car Broke Down	3	2		0

Needed Water	2	0		0
Needed Food	3	1		0
Needed Restroom	8	11		8
Other Difficulties	1	0		0
No Difficulties	87	86		92

Table 34. Heard About Refuge Options After Leaving Home

	Cat 1 Surge Zone N=266	Other Surge Zones N=150	Coastal County Non-surge N=0	Non-coastal Counties N=25
Yes	38	53		48
No	59	44		52
Don't Know	3	3		0

Table 35. Changed Plans Because of Refuge Information Heard After Leaving Home

	Cat 1 Surge Zone N=99	Other Surge Zones N=75	Coastal County Non-surge N=0	Non-coastal Counties N=12
Yes	10	9		0
No	90	91		100

Table 36. Difficulties Experienced Returning from Evacuation

	Cat 1 Surge Zone N=267	Other Surge Zones N=150	Coastal County Non-surge N=0	Non-coastal Counties N=25
Lack of Information	0	0		0
Roads Blocked by Water/Debris	0	1		0
Traffic Congested	3	2		0
Re-entry Not Permitted	0	0		0
Other Difficulties	1	0		0
No Difficulties	96	97		100

Vehicle use was typical of most evacuations, in which 65% to 75% of the available vehicles are used (Table 37). Few households required assistance in evacuating, and in most instances outside agencies were not required (Table 38).

Table 37. Vehicle Use by Evacuating Households

	Cat 1 Surge Zone N=266	Other Surge Zones N=150	Coastal County Non-surge N=0	Non-coastal Counties N=25
Percent of Available	65	73		62
Avg. Number Per Household	1.37	1.5		1.28
Pulled Trailer, Took Motorhome	5.8	7.5		4.2

Table 38. Required Assistance in Evacuating (As a Percent of All Households)

	Cat 1 Surge Zone N=267	Other Surge Zones N=149	Coastal County Non-surge N=0	Non-coastal Counties N=25
Yes, Within Household	4	5		0
Yes, Friend/ Relative	3	2		0
Yes, Agency	0	0		0
No	92	93		100

Local television was relied upon most heavily by the respondents for information about Floyd, followed closely by The Weather Channel (Table 39). Local radio was the third most relied-upon

source of information.

Table 39. Sources Relied On a Great Deal for Information about Floyd

	Cat 1 Surge Zone N=303	Other Surge Zones N=197	Coastal County Non-surge N=0	Non-coastal Counties N=103
Local Radio	34	46		33
Local Television	65	72		67
CNN	23	23		20
Weather Channel	61	70		53
Other Cable	5	6		6
Internet	3	4		2
AOL	<1	1		0
Word of Mouth	14	17		9

Coastal respondents tended to say they would leave earlier or do nothing different if faced with the same circumstances again as in Floyd (Table 40). Some who left wouldn't, but some who didn't leave would. Most non-coastal respondents said they would do nothing different.

Table 40. Would Do Differently Next Time

	Cat 1 Surge Zone N=302	Other Surge Zones N=197	Coastal County Non-surge N=0	Non-coastal Counties N=103
Would Leave	6	8		8
Wouldn't Leave	12	9		3
Leave Earlier	32	37		3
Leave Later	3	7		0
Go Farther	1	1		0
Go Closer	3	1		0
Use Public Shelter	1	0		0
Not Use Pub Shltr	0	0		0
Different Route	1	4		0
Buy Gasoline	0	0		0
Take Provisions	1	2		0
Other	2	4		6
Don't Know	4	1		2
Nothing Different	46	39		80

Chapter 11

Public Response to Hurricane Floyd

In Eastern North Carolina

Prepared by

Earl J. Baker

Hazards Management Group, Inc.

Survey Method

Approximately 600 telephone interviews were conducted in eastern North Carolina region. The sample was stratified as follows:

1. 200 interviews on the Outer Banks

2. 200 interviews in areas at risk to storm surge along Albemarle and Pamlico Sounds

3. 100 interviews in areas of coastal counties on the sounds not subject to inundation by storm surge

4. 100 interviews in non-coastal counties adjacent to those along the sounds.

Storm surge inundation areas delineated in the most recent hurricane evacuation study for the region were used to identify the sampling areas. A copy of the generic questionnaire used in post-Floyd surveys is included as Appendix I.

Statistical Reliability

Figures reported from surveys cited in this report are based upon samples taken from larger populations. The sample values provide estimates of the values of the larger populations from which the samples were selected, but usually are not precisely the same as the true population values. In general, the larger the number of people in the sample, the closer the sample value will be to the true population value. A sample of 200 will provide estimates which one can be 90% “confident” are within 4 to 6 percentage points of the true populations values, whereas a sample of 100 will provide the same degree of confidence of being within 5 to 8 percentage points of the true population values. With a sample of 50, one can be 90% "confident" of being within 7 to 11 percentage points of the actual population value, and a sample of 25 is 90% "accurate" only within 10 to 17 percentage points. With a sample of 50, one can be 90% "confident" of being within 7 to 12 percentage points of the actual population value. A sample of 25 is 90% "accurate" only within 10 to 17 percentage points.

The ranges (e.g., "10 to 17") stem from the fact that the reliability of an estimate depends not only on the size of the sample but also upon how much agreement there is among the responses. Having 90% of the respondents give a particular answer means almost everyone agreed. By the same reasoning, if only 10% gave a particular response, almost everyone agreed (i.e., 90% disagreed with the 10% but agreed with one another). The maximum disagreement is for the responses to be split 50-50. Thus, if 90% (or 10%) of a sample of 100 give a particular response, that estimate will be within 5 percentage points of the true population value 90% of the time. If 75% (or 25%) of a sample of 100 give a particular response, that estimate will be within 7 percentage points 90% of the time. If 50% of a sample of 100 give a particular response, that estimate will be within 8 percentage points 90% of the time.

Therefore, readers should keep in mind that some estimates provided in this report are more statistically reliable than others. This is particularly noteworthy in drawing conclusions about whether two survey results are "different" from one another. Differences of a few percentage points in sample results of 100 or less do not necessarily mean the populations from which the samples were drawn are different. When the aggregate samples are broken down into subgroups, the reliability of estimates for the subgroups suffers. Tables contain actual sample sizes used to calculate the values reported in the table. Sample sizes vary from table to table because not all questions were asked of all respondents (people who didn't evacuate weren't asked where they went, for example), some respondents refused to answer some questions, and in a few cases responses were invalid. There are so few respondents in certain risk zones for some questions that the results are not useful for generalizations. They are included solely for completeness.

In nearly all tables data refer to percentages of respondents. In response to some questions respondents could give more than one answer, resulting in totals exceeding 100%.

Evacuation Participation Rates

Evacuation, as used in the survey, refers to leaving one's home to go someplace safer. On the Outer Banks and along the sounds only 20% evacuated (Table 1). The "shadow" evacuation in other risk areas (i.e., evacuation from areas not told by officials to evacuate) was almost as high.

Table 1. Percent who left their homes in Floyd, by risk zone

	Outer Banks N=199	Other Surge Zones N=198	Coastal Non-surge N=100	Non-coastal Counties N=102
Evacuated	20	19	15	18

Most of the residents who did not evacuate gave the same reason: they felt their home would be safe enough, given their beliefs about the likely track and strength of the storm (Table 2). No other single reason was prominent in the responses.

Table 2. Why Stayed (Percent of Respondents)

	Outer Banks N=153	Other Surge Zones N=158	Coastal County Non-Surge N=83	Non-coastal Counties N=84
House OK for Storm	64	79	80	73
Officials Said Stay	3	11	7	10
Media Said Stay	5	6	1	4
Friends Said Stay	3	2	1	6
Officials Didn't Say Leave	2	4	7	12
Probabilities Low	20	15	10	16
Other Info. Would Miss	5	2	1	6
No Transport	0	2	0	0
No Place to Go	6	2	4	5
Protect from Looters	1	1	0	1
Protect from Storm	1	3	2	0
Left in Past Miss	5	1	1	1

Table 2. Why Stayed (Percent of Respondents) continued

Job	7	4	1	5
Waited Too Long	0	0	1	0
Traffic	5	2	1	1
Tried, Gave Up	0	0	0	0
Dangerous on Road	2	0	1	1
Pets	1	3	0	1
Required Medical Care	2	0	0	0
Other	9	5	7	4
Don't Know	1	1	4	2

Jobs were mentioned by some, and respondents were asked specifically whether anyone in their household had to work during Floyd and how that affected their evacuation (Tables 3, 4). At least a fifth said someone in the household had to work, but few said it either prevented part of the household from evacuating or delayed their departure.

Table 3. Someone in Household Had to Work in Floyd

	Outer Banks N=200	Other Surge Zones N=198	Coastal County Non-surge N=100	Non-coastal Counties N=102
Yes	37	27	19	27

No	63	72	81	73

Table 4. How Work Affected Evacuation in Floyd

	Outer Banks N=73	Other Surge Zones N=53	Coastal County Non-surge N=19	Non-coastal Counties N=26
None	80	77	95	77
Kept All from Leaving	7	6	0	4
Kept Part from Leaving	3	0	5	0
Delayed All in Leaving	6	8	0	4
Delayed Part in Leaving	4	0	0	8
Other	1	9	0	8

Those who didn't evacuate were asked whether they would have left had they been convinced the storm was going to strike, and more than half in surge areas said they would have (Table 5). Most in all areas said they had made the necessary preparations to leave in case conditions worsened (Table 6).

Table 5. Stayers Who Say They Would Have Left If Convinced Storm Was Going to Hit

	Outer Banks N=157	Other Surge Zones N=161	Coastal County Non-surge N=84	Non-coastal Counties N=84
Would Have Left	61	60	45	49
Wouldn't Have Left	27	30	46	38
Don't Know	12	11	8	13

Table 6. Stayers Who Say They Had Made Necessary Preparations to Leave

	Outer Banks N=157	Other Surge Zones N=161	Coastal County Non-surge N=84	Non-coastal Counties N=84
Had Prepared	74	70	61	63
Hadn't Prepared	26	27	39	33
Don't Know	0	3	0	4

Evacuees were asked what convinced them to leave, and most indicated some combination of response to actions by public officials, concern about storm conditions, and appeals from friends and the media (Table 7.)

Table 7. Why Left (Percent of Respondents)

	Outer Banks N=37	Other Surge Zones N=32	Coastal County Non-surge N=15	Non-coastal Counties N=18
Officials Said Leave	16	6	7	6
NWS Said Leave	8	19	7	11
Police/Fire Said Leave	8	0	0	6
Media Said Leave	5	16	7	22
Friend Said Leave	14	19	13	11
Storm Severe	16	38	13	22
Heard “Bad as Hugo/ Andrew”	3	0	0	0
Increased in Strength	0	3	0	6
Concerned about Flooding	8	25	20	17
Concerned about Winds	22	19	33	22
Concerned re. Road Flooding	3	3	7	11
Probability of Hit	5	19	7	6
Post-Storm Concerns	0	0	0	6
Other	19	6	13	28
Don’t Know	0	0	0	0

In an attempt to separate the effect of messages disseminated by government officials via the media from the

effect of other information heard via the media, respondents were asked which had the greater impact on their decision to evacuate. Information from officials had the greater impact in surge zones, but not in other areas, according to respondents (Table 8).

Table 8. Greatest Influence to Leave (Percent of Respondents)

	Outer Banks N=38	Other Surge Zones N=33	Coastal County Non-surge N=15	Non-coastal Counties N=18
Media Info from Gov't Officials	66	46	33	28
Other Media Info	11	21	47	28
Info from Friends	13	33	20	22
Other	11	9	7	17
Don't Know	3	0	0	6

Interviewees were also asked whether they heard from officials – either directly or indirectly – that they should evacuate. Only in the on the Outer Banks did a majority say they did, and even there almost as many did not (Table 9). Those who did hear evacuation notices were more likely than others to evacuate, particularly if they believed the notice to be mandatory (Table 10).

Table 9. Heard Evacuation Notices from Officials

	Outer Banks N=200	Other Surge Zones N=198	Coastal County Non-Surge N=100	Non-coastal Counties N=102
Heard Notices	52	13	6	13
Didn't Hear	42	85	92	87
Don't Know	7	3	2	0

Table 10. Evacuation Participation Rates, by Hearing Evacuation Notices from Officials (Sample sizes vary by cell)

	Outer Banks	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Heard Must	40	30	0	75
Heard Should	14	47	60	50
Didn't Hear	10	14	12	12

Most people living in the coastal counties, even those on the Outer Banks, believe they would be safe in a 125 MPH hurricane in their own homes (Table 11a). Residents believing they would be unsafe in a 125 MPH hurricane were only slightly more likely than others to evacuate in Floyd, especially those in surge-prone locations (Table 11b).

Table 11a. Perceived Safety of Home from Wind and Water in 125 MPH Hurricane

	Outer Banks N=200	Other Surge Zones N=198	Coastal County Non-Surge N=100	Non-coastal Counties N=102
Safe	50	52	57	40
Unsafe	42	38	36	47
Don't Know	9	10	7	13

Table 11b. Evacuation Participation Rates, by Perceived Safety in 125 MHP Storm (See previous table for sample sizes for each cell)

	Outer Banks	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Safe	17	16	5	12
Unsafe	24	22	31	27
Don't Know	18	21	14	0

Evacuation Timing

Evacuation departures were fairly gradual, primarily during September 14 and 15, with the steepest portion of the response on the 15th. Forty percent of the eventual evacuees had left by 8 AM on the 15th. A hurricane watch was issued for the area at 5 PM on the 14th, followed by a warning at 11 AM on the 15th.

Use of Public Shelters and Other Refuges

The majority of evacuees from most areas went to the homes of friends and relatives or to hotels and motels (Table 12). In surge areas no one said they went to public shelters, and few did so in non-surge areas. Hotel and motel use was high, especially among those leaving from the Outer Banks.

Table 12. Refuges Uses by Evacuees

	Outer Banks N=39	Other Surge Zones N=33	Coastal County Non-Surge N=15	Non-coastal Counties N=18
Public Shelter	0	0	7	11
Church	0	0	13	0
Friend/Relative	44	70	60	61
Hotel/Motel	49	24	13	17
Workplace	0	0	7	6
Other	8	6	0	6

Evacuation Destinations and Transportation Issues

Most evacuees from surge areas left their own county, going elsewhere in North Carolina (Tables 13, 14). Thirty-three percent went into Virginia, and 10% went further north.

Table 13. Percent of evacuees by destination, by risk zone

	Outer Banks N=39	Other Surge Zones N=33	Coast Non-Surge N=15	Non-Coastal Counties N=18
Own Neighborhood	8	18	67	61
Own County	8	30	13	33

Out of County	84	52	20	6

Table 14. Percent of out-of-county evacuees, by state destination

Florida	2
Georgia	0
South Carolina	0
North Carolina	56
Virginia	33
Alabama	0
Tennessee	0
Other (north of VA)	10

Going out of county (beyond the surge inundation limits) was motivated by four main factors: the strength of the storm, the location of friends and family, previous hurricane experience, and the lack of closer motels (Table 15). Information from government officials conveyed by the media had a greater influence than other media information (Table 16). Samples in none of the four risk zones are large, but the ones in the non-surge areas too small to be of any value for this variable.

Table 15. Why Went Out of County

	Outer Banks N=31	Other Surge Zone N=17	Coastal County Non-surge N=3	Non-coastal Counties N=1
Strength of Storm	29	35		
Previous Hurri-cane Experience	10	18	0	0
Comparisons to Hugo/Andrew	0	0	0	0

Officials Said Leave County	7	0	0	0
Media Said Leave County	0	0	0	0
Friend Said Leave County	10	12	33	0
Friend Lives in Destination	36	41	33	100
No Public Shelter Closer	0	0	0	0
No Motels Closer	7	12	33	0
Other	3	24	0	100
Don't Know	0	0	0	0

Table 16. Greatest Influence for Going Out of County

	Outer Banks N=31	Other Surge Zones N=17	Coastal County Non-surge N=3	Non-coastal Counties N=1
Media Info from Gov't Officials	39	29	0	0
Other Media Info	19	18	33	0
Info from Friends	36	41	67	0
Other	10	12	0	100
Don't Know	0	6	0	0

At least 90% of the evacuees from most risk areas eventually reached their destinations (Table 17). Too few changed destinations to reveal any patterns regarding the nature or reasons for the changes (Tables 18, 19).

Table 17. Whether Reached Original Destination

	Outer Banks N=157	Other Surge Zones N=161	Coastal County Non-surge N=84	Non-coastal Counties N=84
Yes	97	91	100	94
No	3	9	0	6
Don't Know	0	0	0	0

Table 18. Proximity of New Destination, Compared to Original Destination

	Outer Banks N=1	Other Surge Zones N=3	Coastal County Non-surge N=0	Non-coastal Counties N=0
Farther	0	100		
Closer	100	0		
Same	0	0		
Don't Know	0	0		

Table 19. Why Changed Destination

	Outer Banks N=1	Other Surge Zones N=3	Coastal County Non-surge N=0	Non-coastal Counties N=0
Traffic	100	33		
Better Route	0	0		
Loc. of Refuge	0	67		
Out of Gas	0	0		
Tired	0	0		
Hungry	0	0		
Bathroom	0	0		
Storm Strengthened	0	0		
Storm Close	0	0		
Other	100	0		
Don't Know	0	0		

Most people said they did not hear about traffic problems on evacuation routes before leaving home (Table 20). Of those who heard about such problems before leaving home, most did not change their evacuation route plans (Table 21).

Table 20. Heard About Evacuation Route Problems Before Leaving Home

	Outer Banks N=38	Other Surge Zones N=33	Coastal County Non-surge N=15	Non-coastal Counties N=18
Yes	32	18	13	22
No	66	82	87	78

Don't Know	3	0	0	0

Table 21. Changed Routes Because of Information Heard Before Leaving Home

	Outer Banks N=12	Other Surge Zones N=6	Coastal County Non-surge N=2	Non-coastal Counties N=4
Yes	8	50	0	50
No	92	50	100	50

Those who said they had heard about evacuation problems before leaving home were also asked whether they heard about such problems after leaving home. Some said they did, but responses varied among risk areas, and sample sizes were too small for useful generalizations (Tables 22, 23).

Table 22. Heard About Evacuation Route Problems After Leaving Home

	Outer Banks N=11	Other Surge Zone N=6	Coastal County Non-surge N=2	Non-coastal Counties N=4
Yes	55	17	0	0
No	45	83	100	100
Don't Know	0	0	0	0

Table 23. Changed Routes Because of Information Heard After Leaving Home

	Outer Banks N=6	Other Surge Zones N=1	Coastal County Non-surge N=0	Non-coastal Counties N=0
Yes	0	0		
No	100	100		

Except on the Outer Banks most evacuees did not use interstate highways for even part of their evacuation (Table 24). Those who used interstates in Floyd were inclined to use them again (Table 25). The great majority of the respondents said they were familiar with the roads in the area through which they evacuated (Table 26). More than 80% also said they would be willing to use a different route than they would normally use if government officials urged them to do so to avoid congestion, even if the route took them out of their way (Table 27).

Table 24. Used Interstate for at Least Part of Route

	Outer Banks N=39	Other Surge Zones N=33	Coastal County Non-surge N=15	Non-coastal Counties N=18
Yes	62	27	7	22
No	38	73	93	78
Don’t Know	0	0	0	0

Table 25. Routes to be Used in the Future

	Outer Banks N=23	Other Surge Zones N=9	Coastal County Non-surge N=1	Non-coastal Counties N=4
Interstate	70	56	100	75
Secondary Roads	0	33	0	0
Both	17	11	0	0
Depends on Traffic	0	0	0	25
Depends on Other	9	0	0	0
Other	0	0	0	0
Don't Know	4	0	0	0

Table 26. Familiar with Roads in Area

	Outer Banks N=39	Other Surge Zones N=32	Coastal County Non-surge N=15	Non-coastal Counties N=18
Yes	85	81	100	83
No	15	19	0	17
Don't Know	0	0	0	0

Table 27. Would Use Routes Advised by Officials, Even if Longer

	Outer Banks N=39	Other Surge Zones N=33	Coastal County Non-surge N=15	Non-coastal Counties N=18
Yes	82	85	80	94

No	8	6	7	0
Depends How Much Longer	3	6	0	6
Depends on Other	5	3	7	0
Other	0	0	0	0
Don't Know	3	0	7	0

Less than half the respondents said it took them five or more hours to reach their destination and except on the Outer Banks most people took less than two horus (Table 28). Still, times were longer than expected (Table 29). When asked how long it was reasonable for an evacuation like Floyd's to take, most respondents gave times shorter than the actual evacuation but slightly longer than their original expectation (Table 30).

Table 28. Hours Required to Reach Destination

	Outer Banks N=38	Other Surge Zones N=32	Coastal County Non-surge N=15	Non-coastal Counties N=17
Less than 2	26	78	100	100
2 to 5	37	3	0	0
5 to 10	32	19	0	0
10 or more	5	0	0	0
Mean No. Hrs	4.7	2.1	.7	.6
Median No. Hrs	4.0	.5	.5	.5

Table 29. Hours Expected to Reach Destination

	Outer Banks N=38	Other Surge Zones N=30	Coastal County Non-surge N=15	Non-coastal Counties N=17
Less than 2	34	77	100	100
2 to 5	50	17	0	0
5 to 10	16	7	0	0
10 or more	0	0	0	0
Mean No. Hrs	3.6	1.6	.7	.6
Median No. Hrs	3.3	.5	.5	.5

Table 30. Hours Reasonable to Reach Destination

	Outer Banks N=37	Other Surge Zones N=29	Coastal County Non-surge N=15	Non-coastal Counties N=15
Less than 2	30	76	100	100
2 to 5	49	17	0	0
5 to 10	22	7	0	0
10 or more	0	0	0	0
Mean No. Hrs	3.8	1.7	.7	.6
Median No. Hrs	3.5	.5	.5	.5

Most people thought the traffic delays were caused mainly by the sheer volume of traffic, the fact that too many people left at once, and bad weather (Table 31). Some also cited poor traffic management. More than 85% of the respondents said they would be willing to cooperate in a phased evacuation in which they would delay their departure for a few hours until people in a more dangerous location had begun their evacuation (Table 32).

Table 31. Why Traffic Was Slow

	Outer Banks N=39	Other Surge Zones N=33	Coastal County Non-surge N=15	Non-coastal Counties N=18
Number of Cars	26	15	7	28
All Left at Once	15	9	7	22
Waited too Long	8	9	7	33
Construction	5	0	0	6
Accidents	5	0	0	0
Poor Traffic Management	13	9	0	0
Need Reverse Lanes	0	0	0	0
Bad Weather	13	0	27	22
Other	8	3	40	6
Don't Know	36	64	27	33

Table 32. Would Delay Departure if Urged by Officials

	Outer Banks N=200	Other Surge Zones N=198	Coastal County Non-surge N=100	Non-coastal Counties N=101
Yes	89	93	87	94
Depends on Storm's Proximity	2	1	4	1

Depends on Storm's Strength	1	1	4	3
Other	1	0	0	0
Don't Know	3	2	3	1
No	5	4	2	1

Most evacuees did not cite specific difficulties experienced during the evacuation. Needing restroom facilities was most common mention (Table 33). About half of the evacuees from coastal counties said they heard about places where they could find shelter if they weren't able to reach their destinations (Table 34). No one said they changed plans about seeking shelter as a result (Table 35). Many interviewees reported roads being blocked by water when returning from the evacuation (Table 36).

Table 33. Difficulties Experienced in Evacuation

	Outer Banks N=39	Other Surge Zones N=33	Coastal County Non-surge N=15	Non-coastal Counties N=18
Ran Out of Gas	0	0	0	0
Car Broke Down	0	0	0	0
Needed Water	0	0	0	0
Needed Food	0	0	0	0
Needed Restroom	3	0	0	0
Other Difficulties	0	3	0	0
No Difficulties	97	97	100	100

Table 34. Heard About Refuge Options After Leaving Home

	Outer Banks N=39	Other Surge Zones N=33	Coastal County Non-surge N=15	Non-coastal Counties N=18
Yes	41	49	53	17
No	56	52	33	61
Don't Know	3	0	13	22

Table 35. Changed Plans Because of Refuge Information Heard After Leaving Home

	Outer Banks N=15	Other Surge Zones N=16	Coastal County Non-surge N=8	Non-coastal Counties N=3
Yes	0	100	0	0
No	100	94	100	100

Table 36. Difficulties Experienced Returning from Evacuation

	Outer Banks N=39	Other Surge Zones N=33	Coastal County Non-surge N=15	Non-coastal Counties N=18
Lack of Information	3	0	0	0
Roads Blocked by Water/Debris	41	51	20	50
Traffic Congested	15	6	0	0

Re-entry Not Permitted	0	3	0	6
Other Difficulties	0	3	0	0
No Difficulties	49	46	80	44

Vehicle use was slightly below that in most evacuations, in which 65% to 75% of the available vehicles are used (Table 37). Few households required assistance in evacuating, and reliance on outside agencies varied with location (Table 38).

Table 37. Vehicle Use by Evacuating Households

	Outer Banks N=39	Other Surge Zones N=33	Coastal County Non-surge N=15	Non-coastal Counties N=18
Percent of Available	59	63	60	58
Avg. Number Per Household	1.21	1.12	1.0	1.0
Pulled Trailer, Took Motorhome	13	3	7	7

Table 38. Required Assistance in Evacuating (As a Percent of All Households)

	Outer Banks N=39	Other Surge Zones N=33	Coastal County Non-surge N=15	Non-coastal Counties N=18
Yes, Within Household	3	0	0	0

Yes, Friend/ Relative	0	0	7	0
Yes, Agency	3	0	0	11
No	95	100	93	89

On the Outer Banks The Weather Channel was relied upon most heavily by the respondents for information about Floyd, followed by local television (Table 39). In other areas the order was reversed. Local radio was the third most relied-upon source of information.

Table 39. Sources Relied On a Great Deal for Information about Floyd

	Outer Banks N=199	Other Surge Zones N=197	Coastal County Non-surge N=100	Non-coastal Counties N=101
Local Radio	37	25	31	34
Local Television	57	76	88	81
CNN	26	17	13	11
Weather Channel	78	54	48	46
Other Cable	9	9	6	3
Internet	7	2	3	4
AOL	3	2	1	4
Word of Mouth	7	8	9	15

Most respondents in the sample said they wouldn't do anything differently if faced with the same circumstances again as in Floyd (Table 40). Some who left wouldn't, but some who didn't leave would. Some would plan to

leave earlier.

Table 40. Would Do Differently Next Time

	Outer Banks N=200	Other Surge Zones N=198	Coastal County Non-surge N=100	Non-coastal Counties N=100
Would Leave	6	5	8	6
Wouldn't Leave	10	6	1	7
Leave Earlier	2	5	4	10
Leave Later	2	0	0	0
Go Farther	0	1	0	0
Go Closer	0	1	0	0
Use Public Shelter	0	0	0	0
Not Use Pub Shltr	0	0	0	1
Different Route	0	1	0	0
Buy Gasoline	0	0	0	1
Take Provisions	1	1	1	12
Other	2	5	4	2
Don't Know	3	5	4	2
Nothing Different	79	75	79	59

Cover

Chapter 3

Public Response to Hurricane Floyd

In East-Central Florida

Prepared by

Earl J. Baker

Hazards Management Group, Inc.

Survey Method

Approximately 600 telephone interviews were conducted in the East-Central Florida region, including the coastal counties of Volusia and Brevard. The sample was stratified as follows:

1. 200 interviews in areas at risk to storm surge in category 1 hurricanes

2. 200 interviews in areas at risk to storm surge in stronger hurricanes

3. 100 interviews in areas of coastal counties not subject to inundation by storm surge

4. 100 interviews in non-coastal counties adjacent to Volusia and Brevard.

Evacuation zones defined in the most recent hurricane evacuation study for the region were used to identify the sampling areas. A copy of the generic questionnaire used in post-Floyd surveys is included as Appendix I.

Statistical Reliability

Figures reported from surveys cited in this report are based upon samples taken from larger populations. The sample values provide estimates of the values of the larger populations from which the samples were selected, but usually are not precisely the same as the true population values. In general, the larger the number of people in the sample, the closer the sample value will be to the true population value. A sample of 200 will provide estimates which one can be 90% “confident” are within 4 to 6 percentage points of the true populations values, whereas a sample of 100 will provide the same degree of confidence of being within 5 to 8 percentage points of the true population values. With a sample of 50, one can be 90% "confident" of being within 7 to 11 percentage points of the actual population value, and a sample of 25 is 90% "accurate" only within 10 to 17 percentage points. With a sample of 50, one can be 90% "confident" of being within 7 to 12 percentage points of the actual population value. A sample of 25 is 90% "accurate" only within 10 to 17 percentage points.

The ranges (e.g., "10 to 17") stem from the fact that the reliability of an estimate depends not only on the size of the sample but also upon how much agreement there is among the responses. Having 90% of the respondents give a particular answer means almost everyone agreed. By the same reasoning, if only 10% gave a particular response, almost everyone agreed (i.e., 90% disagreed with the 10% but agreed with one another). The maximum disagreement is for the responses to be split 50-50. Thus, if 90% (or 10%) of a sample of 100 give a particular response, that estimate will be within 5 percentage points of the true population value 90% of the time. If 75% (or 25%) of a sample of 100 give a particular response, that estimate

will be within 7 percentage points 90% of the time. If 50% of a sample of 100 give a particular response, that estimate will be within 8 percentage points 90% of the time.

Therefore, readers should keep in mind that some estimates provided in this report are more statistically reliable than others. This is particularly noteworthy in drawing conclusions about whether two survey results are "different" from one another. Differences of a few percentage points in sample results of 100 or less do not necessarily mean the populations from which the samples were drawn are different. When the aggregate samples are broken down into subgroups, the reliability of estimates for the subgroups suffers. Tables contain actual sample sizes used to calculate the values reported in the table. Sample sizes vary from table to table because not all questions were asked of all respondents (people who didn't evacuate weren't asked where they went, for example), some respondents refused to answer some questions, and in a few cases responses were invalid. There are so few respondents in certain risk zones for some questions that the results are not useful for generalizations. They are included solely for completeness.

In nearly all tables data refer to percentages of respondents. In response to some questions respondents could give more than one answer, resulting in totals exceeding 100%.

Evacuation Participation Rates

Evacuation, as used in the survey, refers to leaving one's home to go someplace safer. In the category 1 risk zone, 74% evacuated, as did slightly more than half in other surge zones and 42% from non-surge areas of the coastal counties (Table 1). Only residents of the category 1 surge zone, plus mobile homes, were ordered by officials to evacuate. Others were considered "shadow" evacuees.

Table 1. Percent who left their homes in Floyd, by risk zone

	Cat 1 Surge Zone N=204	Other Surge Zones N=201	Coastal Non-surge N=100	Non-coastal Counties N=100
Evacuated	74	52	42	12

Most of the residents who did not evacuate gave the same reason: they felt their home would be safe enough, given their beliefs about the likely track and strength of the storm (Table 2). No other single reason was prominent in the responses.

Table 2. Why Stayed (Percent of Respondents)

	Cat 1 Surge Zone N=49	Other Surge Zones N=94	Coastal County Non-Surge N=56	Non-coastal Counties N=88
House OK for Storm	59	63	66	61
Officials Said Stay	6	1	4	16
Media Said Stay	4	1	4	9
Friends Said Stay	2	4	4	2
Officials Didn't Say Leave	8	7	4	10
Probabilities Low	6	10	11	24
Other Info. Would Miss	2	1	2	7
No Transport	4	4	0	0
No Place to Go	8	0	2	1
Protect from Looters	0	1	0	0

Table 2. Why Stayed (Percent of Respondents) continued

Protect from Storm	0	3	0	1
Left in Past Miss	2	3	4	5
Job	8	4	2	5
Waited Too Long	2	2	0	0
Traffic	10	5	2	0

Tried, Gave Up	0	4	0	1
Dangerous on Road	4	2	0	0
Pets	4	6	4	2
Required Medical Care	0	2	0	0
Other	16	10	20	7
Don't Know	2	4	4	0

Jobs were mentioned by some, and respondents were asked specifically whether anyone in their household had to work during Floyd and how that affected their evacuation (Tables 3, 4). At least a fifth said someone in the household had to work, and some (but not most) said it either prevented part of the household from evacuating or delayed their departure.

Table 3. Someone in Household Had to Work in Floyd

	Cat 1 Surge Zone N=203	Other Surge Zones N=201	Coastal County Non-surge N=101	Non-coastal Counties N=100
Yes	18	20	28	41
No	82	80	72	59

Table 4. How Work Affected Evacuation in Floyd

	Cat 1 Surge Zone N=36	Other Surge Zones N=39	Coastal County Non-surge N=28	Non-coastal Counties N=41
None	56	72	79	85
Kept All from Leaving	6	0	0	0
Kept Part from Leaving	0	0	0	0
Delayed All in Leaving	36	28	14	12
Delayed Part in Leaving	0	0	0	0
Other	3	0	7	2

Those who didn't evacuate were asked whether they would have left had they been convinced the storm was going to strike, and half or more said they would have (Table 5). Most in coastal counties also said they had made the necessary preparations to leave in case conditions worsened (Table 6).

Table 5. Stayers Who Say They Would Have Left If Convinced Storm Was Going to Hit

	Cat 1 Surge Zone N=53	Other Surge Zones N=96	Coastal County Non-surge N=58	Non-coastal Counties N=88
Would Have Left	60	64	48	52
Wouldn't Have Left	36	32	41	26
Don't Know	4	4	10	22

Table 6. Stayers Who Say They Had Made Necessary Preparations to Leave

	Cat 1 Surge Zone N=53	Other Surge Zones N=96	Coastal County Non-surge N=58	Non-coastal Counties N=88
Had Prepared	62	65	55	49
Hadn't Prepared	38	34	41	51
Don't Know	0	1	3	0

Evacuees were asked what convinced them to leave, and most indicated some combination of response to actions by public officials, media messages, and concern about storm conditions (Table 7.)

Table 7. Why Left (Percent of Respondents)

	Cat 1 Surge Zone N=146	Other Surge Zones N=102	Coastal County Non-surge N=40	Non-coastal Counties N=12
Officials Said Leave	35	19	10	42
NWS Said Leave	31	31	23	8
Police/Fire Said Leave	7	2	0	8
Media Said Leave	21	22	20	17
Friend Said Leave	10	20	18	17
Storm Severe	28	29	33	8
Heard “Bad as Hugo/ Andrew”	6	3	1o	0
Increased in Strength	6	4	5	0
Concerned about Flooding	6	9	3	8
Concerned about Winds	13	26	28	42
Concerned re. Road Flooding	1	0	0	0
Probability of Hit	18	8	23	0
Post-Storm Concerns	1	0	0	0
Other	9	12	15	25
Don’t Know	1	1	0	0

In an attempt to separate the effect of messages disseminated by government officials via the media from the effect of other information heard via the media, respondents were asked which had the greater impact on their decision to evacuate. Officials and the media had comparable effects in category 1 areas, but in other risk

zones officials had the greater impact (Table 8).

Table 8. Greatest Influence to Leave (Percent of Respondents)

	Cat 1 Surge Zone N=148	Other Surge Zones N=103	Coastal County Non-surge N=39	Non-coastal Counties N=12
Media Info from Gov't Officials	51	55	46	58
Other Media Info	47	35	31	25
Info from Friends	18	18	26	33
Other	4	6	5	0
Don't Know	0	2	3	0

Interviewees were also asked whether they heard from officials – either directly or indirectly – that they should evacuate. Only in the category 1 risk area did a majority say they did (Table 9). Those who did hear evacuation notices were more likely than others to evacuate, particularly if they believed the notice to be mandatory (Table 10).

Table 9. Heard Evacuation Notices from Officials

	Cat 1 Surge Zone N=201	Other Surge Zones N=201	Coastal County Non-Surge N=101	Non-coastal Counties N=100
Heard Notice	58	33	21	11
Didn't Hear	37	62	76	89
Don't Know	5	5	3	1

Table 10. Evacuation Participation Rates, by Hearing Evacuation Notices from Officials

(Sample sizes vary by cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Heard Must	95	94	63	100
Heard Should	76	59	69	43
Didn't Hear	55	39	34	6

Most people in surge areas believe their homes would not be safe in a 125 MPH hurricane (Table 11a), but the majorities are fairly small. Over 40% of the residents in non-surge areas believe their homes would be unsafe also. In all four risk zones people who perceived their homes to be vulnerable were substantially more likely than others to evacuate (Table 11b).

Table 11a. Perceived Safety of Home from Wind and Water in 125 MPH Hurricane

	Cat 1 Surge Zone N=201	Other Surge Zones N=201	Coastal County Non-Surge N=101	Non-coastal Counties N=100
Safe	24	32	42	42
Unsafe	62	54	44	47
Don't Know	15	13	14	11

Table 11b. Evacuation Participation Rates, by Perceived Safety in 125 MHP Storm (See previous table for sample sizes for each cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Safe	51	31	29	2
Unsafe	82	62	52	19
Don't Know	73	59	43	18

Evacuation Timing

Evacuation departures were fairly gradual, primarily during September 13 and 14, with the evacuation almost evenly divided between the two days. By the end of the 13th almost half the evacuees had left. A hurricane watch was issued for the area at 5 AM on the 13th, followed by a warning at 5 PM later that same day.

Use of Public Shelters and Other Refuges

The great majority of evacuees went to the homes of friends and relatives or to hotels and motels (Table 12). Five percent or fewer of those interviewed said they went to public shelters.

Table 12. Refuges Uses by Evacuees

	Cat 1 Surge Zone N=149	Other Surge Zones N=101	Coastal County Non-Surge N=40	Non-coastal Counties N=10
Public Shelter	4	5	0	0
Church	0	4	0	0
Friend/Relative	56	53	70	50
Hotel/Motel	36	28	28	40
Workplace	1	1	0	0
Other	4	10	3	10

Evacuation Destinations and Transportation Issues

Most coastal county evacuees left their own county, going elsewhere in Florida (Tables 13, 14). Ten percent went into Georgia.

Table 13. Percent of evacuees by destination, by risk zone

	Cat 1 Surge Zone N=146	Other Surge Zones N=103	Coast Non-Surge N=41	Non-Coastal Counties N=11
Own Neighborhood	3	10	7	27
Own County	2	10	12	45
Out of County	77	80	80	27

Table 14. Percent of out-of-county evacuees, by state destination

Florida	84
Georgia	10
South Carolina	1
North Carolina	1
Virginia	<1
Alabama	3
Tennessee	<1
Other	<1

Going out of county was motivated by three main factors: the strength of the storm, the location of friends and family, and the lack of closer motels (Table 15). In category 1 surge areas information from government officials conveyed by the media had about the same influence as other media information (Table 16). Outside the category 1 surge areas government information had a greater influence.

Table 15. Why Went Out of County

	Cat 1 Surge Zone N=110	Other Surge Zone N=81	Coastal County Non-surge N=33	Non-coastal Counties N=3
Strength of Storm	46	28	42	33
Previous Hurri-cane Experience	12	6	6	0
Comparisons to Hugo/Andrew	5	0	3	0
Officials Said Leave County	5	0	6	0
Media Said Leave County	6	3	3	0
Friend Said Leave County	12	10	12	0

Friend Lives in Destination	41	37	39	67
No Public Shelter Closer	1	10	3	0
No Motels Closer	17	37	12	33
Other	7	9	9	0
Don't Know	0	0	0	0

Table 16. Greatest Influence for Going Out of County

	Cat 1 Surge Zone N=110	Other Surge Zones N=81	Coastal County Non-surge N=33	Non-coastal Counties N=3
Media Info from Gov't Officials	36	41	49	67
Other Media Info	37	27	27	0
Info from Friends	29	28	24	33
Other	7	14	12	0
Don't Know	2	0	0	0

Over 75% percent of the evacuees from most risk areas eventually reached their destinations (Table 17). Of those who changed destinations, most went someplace farther than anticipated (Table 18). Traffic, refuge location, and fatigue were the main reasons for changing destinations (Table 19).

Table 17. Whether Reached Original Destination

	Cat 1 Surge Zone N=150	Other Surge Zones N=103	Coastal County Non-surge N=41	Non-coastal Counties N=11
Yes	84	75	90	100
No	16	22	7	0
Don't Know	0	3	2	0

Table 18. Proximity of New Destination, Compared to Original Destination

	Cat 1 Surge Zone N=23	Other Surge Zones N=24	Coastal County Non-surge N=2	Non-coastal Counties N=0
Farther	56	54	50	
Closer	39	38	50	
Same	4	0	0	
Don't Know	0	8	0	

Table 19. Why Changed Destination

	Cat 1 Surge Zone N=22	Other Surge Zones N=23	Coastal County Non-surge N=2	Non-coastal Counties N=0
Traffic	18	26	50	
Better Route	0	0	0	
Loc. of Refuge	50	57	0	
Out of Gas	0	0	0	
Tired	14	4	0	
Hungry	0	0	0	
Bathroom	5	0	0	
Storm Strengthened	0	0	0	
Storm Close	5	0	0	
Other	27	17	50	
Don’t Know	0	9	0	

Most people said they did not hear about traffic problems on evacuation routes before leaving home (Table 20). Of those who heard about such problems before leaving home, most did not change their evacuation route plans (Table 21).

Table 20. Heard About Evacuation Route Problems Before Leaving Home

	Cat 1 Surge Zone N=150	Other Surge Zones N=103	Coastal County Non-surge N=42	Non-coastal Counties N=11
Yes	37	37	29	27
No	61	59	69	64
Don't Know	2	4	2	9

Table 21. Changed Routes Because of Information Heard Before Leaving Home

	Cat 1 Surge Zone N=55	Other Surge Zones N=38	Coastal County Non-surge N=12	Non-coastal Counties N=3
Yes	22	21	17	0
No	78	79	83	100

Those who said they had heard about evacuation problems before leaving home were also asked whether they heard about such problems after leaving home. About half said they did, but responses varied among risk areas (Table 22). Fewer than a third of those changed their route plans accordingly (Table 23).

Table 22. Heard About Evacuation Route Problems After Leaving Home

	Cat 1 Surge Zone N=54	Other Surge Zone N=38	Coastal County Non-surge N=12	Non-coastal Counties N=3
Yes	51	55	67	67
No	46	45	33	33
Don't Know	2	0	0	0

Table 23. Changed Routes Because of Information Heard After Leaving Home

	Cat 1 Surge Zone N=28	Other Surge Zones N=21	Coastal County Non-surge N=8	Non-coastal Counties N=2
Yes	29	14	25	0
No	71	86	75	100

Most coastal evacuees used interstate highways for at least part of their evacuation (Table 24). Those who used interstates in Floyd were inclined to use them again (Table 25). The great majority of the respondents said they were familiar with the roads in the area through which they evacuated (Table 26). More than 80% also said they would be willing to use a different route than they would normally use if government officials urged them to do so to avoid congestion, even if the route took them out of their way (Table 27).

Table 24. Used Interstate for at Least Part of Route

	Cat 1 Surge Zone N=150	Other Surge Zones N=103	Coastal County Non-surge N=42	Non-coastal Counties N=11
Yes	57	61	64	36
No	41	39	36	64
Don't Know	1	0	0	0

Table 25. Routes to be Used in the Future

	Cat 1 Surge Zone N=86	Other Surge Zones N=62	Coastal County Non-surge N=27	Non-coastal Counties N=4
Interstate	67	57	82	100
Secondary Roads	13	21	11	0
Both	6	8	4	0
Depends on Traffic	6	8	0	0
Depends on Other	4	5	4	0
Other	1	2	0	0
Don't Know	4	0	0	0

Table 26. Familiar with Roads in Area

	Cat 1 Surge Zone N=150	Other Surge Zones N=103	Coastal County Non-surge N=42	Non-coastal Counties N=11
Yes	77	80	88	82
No	17	19	12	18
Don't Know	7	1	0	0

Table 27. Would Use Routes Advised by Officials, Even if Longer

	Cat 1 Surge Zone N=149	Other Surge Zones N=103	Coastal County Non-surge N=41	Non-coastal Counties N=11
Yes	80	85	83	100
No	8	6	7	0
Depends How Much Longer	1	1	2	0
Depends on Other	8	5	5	0

Other	1	0	0	0
Don't Know	2	3	2	0

Fewer than half the respondents said it took them five or more hours to reach their destination (Table 28). Still, times were longer than expected (Table 29). When asked how long it was reasonable for an evacuation like Floyd's to take, most respondents gave times shorter than the actual evacuation but slightly longer than their original expectation (Table 30).

Table 28. Hours Required to Reach Destination

	Cat 1 Surge Zone N=142	Other Surge Zones N=100	Coastal County Non-surge N=41	Non-coastal Counties N=12
Less than 2	55	36	37	83
2 to 5	30	17	34	8
5 to 10	13	30	22	8
10 or more	2	17	7	0
Mean No. Hrs	2.9	5.9	4.5	1.5
Median No. Hrs	2.0	5.0	3.5	.5

Table 29. Hours Expected to Reach Destination

	Cat 1 Surge Zone N=136	Other Surge Zones N=95	Coastal County Non-surge N=41	Non-coastal Counties N=11
Less than 2	74	47	51	91
2 to 5	22	32	39	9
5 to 10	4	20	10	0
10 or more	0	1	0	0
Mean No. Hrs	1.8	3.2	2.7	.9
Median No. Hrs	1.5	2.5	2.0	.5

Table 30. Hours Reasonable to Reach Destination

	Cat 1 Surge Zone N=124	Other Surge Zones N=92	Coastal County Non-surge N=38	Non-coastal Counties N=11
Less than 2	60	38	37	91
2 to 5	36	39	37	9
5 to 10	4	22	21	0
10 or more	0	1	5	0
Mean No. Hrs	2.3	3.7	3.7	.8
Median No. Hrs	2.0	3.3	3.0	.5

Most people thought the traffic delays were caused mainly by the sheer volume of traffic and the fact that too many people left at once (Table 31). Some also cited poor traffic management, and a few advocated reversing lane directions. More than 80% of the respondents said they would be willing to cooperate in a phased evacuation in which they would delay their departure for a few hours until people in a more dangerous location had begun their evacuation (Table 32).

Table 31. Why Traffic Was Slow

	Cat 1 Surge Zone N=150	Other Surge Zones N=103	Coastal County Non-surge N=42	Non-coastal Counties N=11
Number of Cars	50	46	60	27
All Left at Once	48	45	50	27
Waited too Long	17	11	19	9
Construction	1	6	0	0
Accidents	1	4	7	9
Poor Traffic Management	13	24	17	9
Need Reverse Lanes	7	8	0	0
Bad Weather	1	12	2	0
Other	15	0	10	18
Don’t Know	18	19	19	46

Table 32. Would Delay Departure if Urged by Officials

	Cat 1 Surge Zone N=203	Other Surge Zones N=201	Coastal County Non-surge N=101	Non-coastal Counties N=100
Yes	89	86	84	86
Depends on Storm's Proximity	3	2	4	1
Depends on Storm's Strength	1	3	2	1
Other	1	1	1	2
Don't Know	3	3	4	4
No	4	6	5	6

Most evacuees did not cite specific difficulties experienced during the evacuation. Needing restroom facilities was most common, but some needed food and water (Table 33). More than a third of the evacuees said they heard about places where they could find shelter if they weren't able to reach their destinations (Table 34). Almost no one changed plans about seeking shelter as a result (Table 35). Few interviewees reported problems when returning from the evacuation (Table 36).

Table 33. Difficulties Experienced in Evacuation

	Cat 1 Surge Zone N=150	Other Surge Zones N=103	Coastal County Non-surge N=42	Non-coastal Counties N=11
Ran Out of Gas	0	0	2	0
Car Broke Down	3	0	0	0
Needed Water	1	3	0	0
Needed Food	1	5	0	0
Needed Restroom	3	7	10	0
Other Difficulties	1	0	0	0
No Difficulties	92	86	91	100

Table 34. Heard About Refuge Options After Leaving Home

	Cat 1 Surge Zone N=150	Other Surge Zones N=102	Coastal County Non-surge N=41	Non-coastal Counties N=11
Yes	44	30	39	36
No	48	65	61	64
Don’t Know	8	5	0	0

Table 35. Changed Plans Because of Refuge Information Heard After Leaving Home

	Cat 1 Surge Zone N=66	Other Surge Zones N=31	Coastal County Non-surge N=15	Non-coastal Counties N=4
Yes	3	0	0	0
No	97	100	100	100

Table 36. Difficulties Experienced Returning from Evacuation

	Cat 1 Surge Zone N=150	Other Surge Zones N=103	Coastal County Non-surge N=42	Non-coastal Counties N=11
Lack of Information	0	0	0	0
Roads Blocked by Water/Debris	3	5	0	0
Traffic Congested	19	13	14	9
Re-entry Not Permitted	2	0	0	0
Other Difficulties	0	2	4	0
No Difficulties	77	83	86	91

Vehicle use was typical of most evacuations, in which 65% to 75% of the available vehicles are used (Table 37). Few households required assistance in evacuating, and in most instances outside agencies were not required (Table 38).

Table 37. Vehicle Use by Evacuating Households

	Cat 1 Surge Zone N=148	Other Surge Zones N=102	Coastal County Non-surge N=42	Non-coastal Counties N=11
Percent of Available	70	68	71	74
Avg. Number Per Household	1.29	1.21	1.35	1.27

Pulled Trailer, Took Motorhome	4.2	7.3	0	9.1

Table 38. Required Assistance in Evacuating (As a Percent of All Households)

	Cat 1 Surge Zone N=150	Other Surge Zones N=103	Coastal County Non-surge N=42	Non-coastal Counties N=11
Yes, Within Household	4	1	0	0
Yes, Friend/ Relative	1	1	2	9
Yes, Agency	1	0	0	0
No	95	98	98	91

Local television was relied upon most heavily by the respondents for information about Floyd, followed by The Weather Channel (Table 39). Local radio and CNN were the next most relied-upon sources of information.

Table 39. Sources Relied On a Great Deal for Information about Floyd

	Cat 1 Surge Zone N=203	Other Surge Zones N=200	Coastal County Non-surge N=98	Non-coastal Counties N=100
Local Radio	26	26	24	15
Local Television	72	84	78	86
CNN	23	30	19	17
Weather Channel	55	56	47	39
Other Cable	5	7	5	1
Internet	5	3	5	1

AOL	2	2	4	1
Word of Mouth	9	12	10	11

Most respondents in the sample said they wouldn't do anything differently if faced with the same circumstances again as in Floyd (Table 40). Some who left wouldn't, but some who didn't leave would. Some would plan to leave earlier.

Table 40. Would Do Differently Next Time

	Cat 1 Surge Zone N=203	Other Surge Zones N=201	Coastal County Non-surge N=101	Non-coastal Counties N=100
Would Leave	8	6	7	8
Wouldn't Leave	7	10	12	3
Leave Earlier	16	13	6	2
Leave Later	2	1	0	4
Go Farther	3	1	0	0
Go Closer	3	2	2	0
Use Public Shelter	1	2	0	1
Not Use Pub Shltr	1	0	0	0

Different Route	2	0	1	0
Buy Gasoline	2	0	0	1
Take Provisions	3	2	0	3
Other	8	7	5	8
Don’t Know	3	2	2	1
Nothing Different	54	63	65	74

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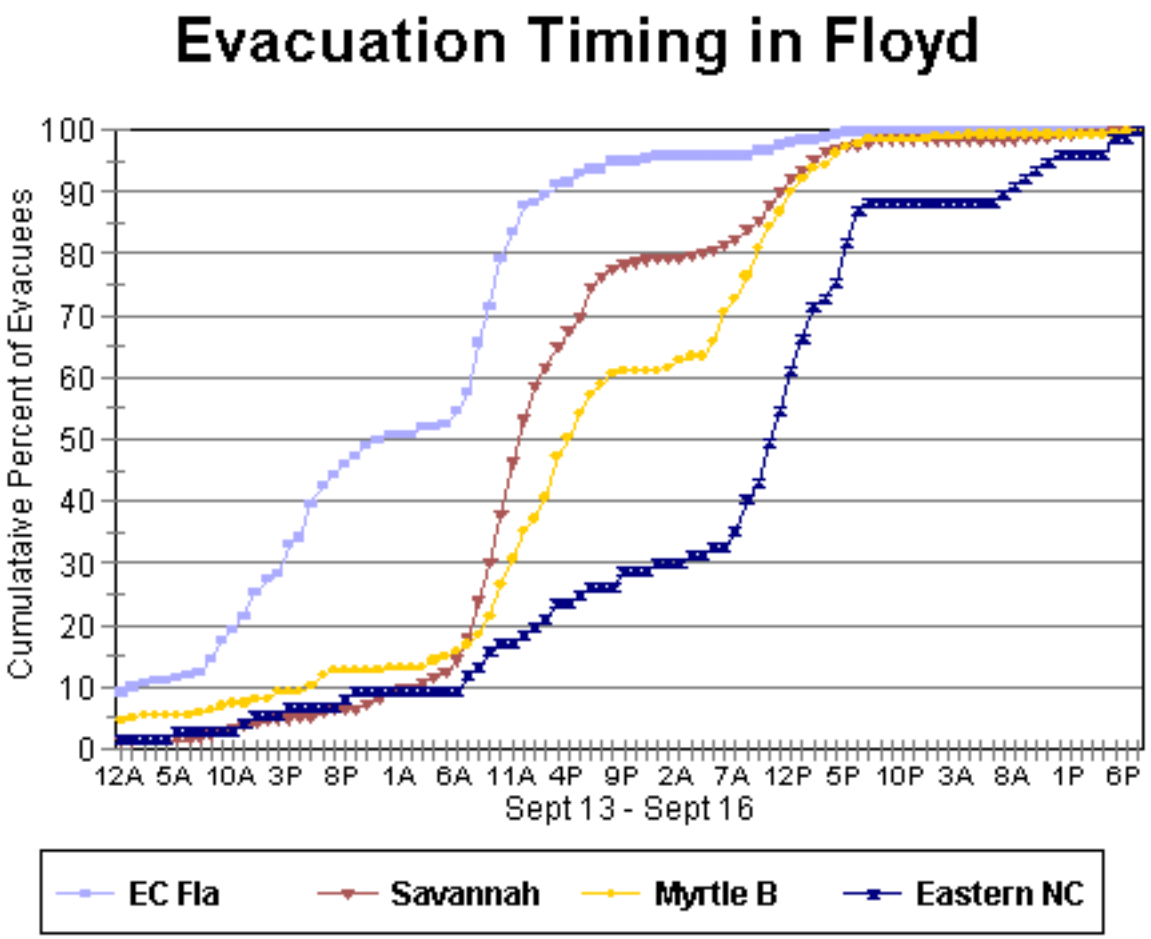
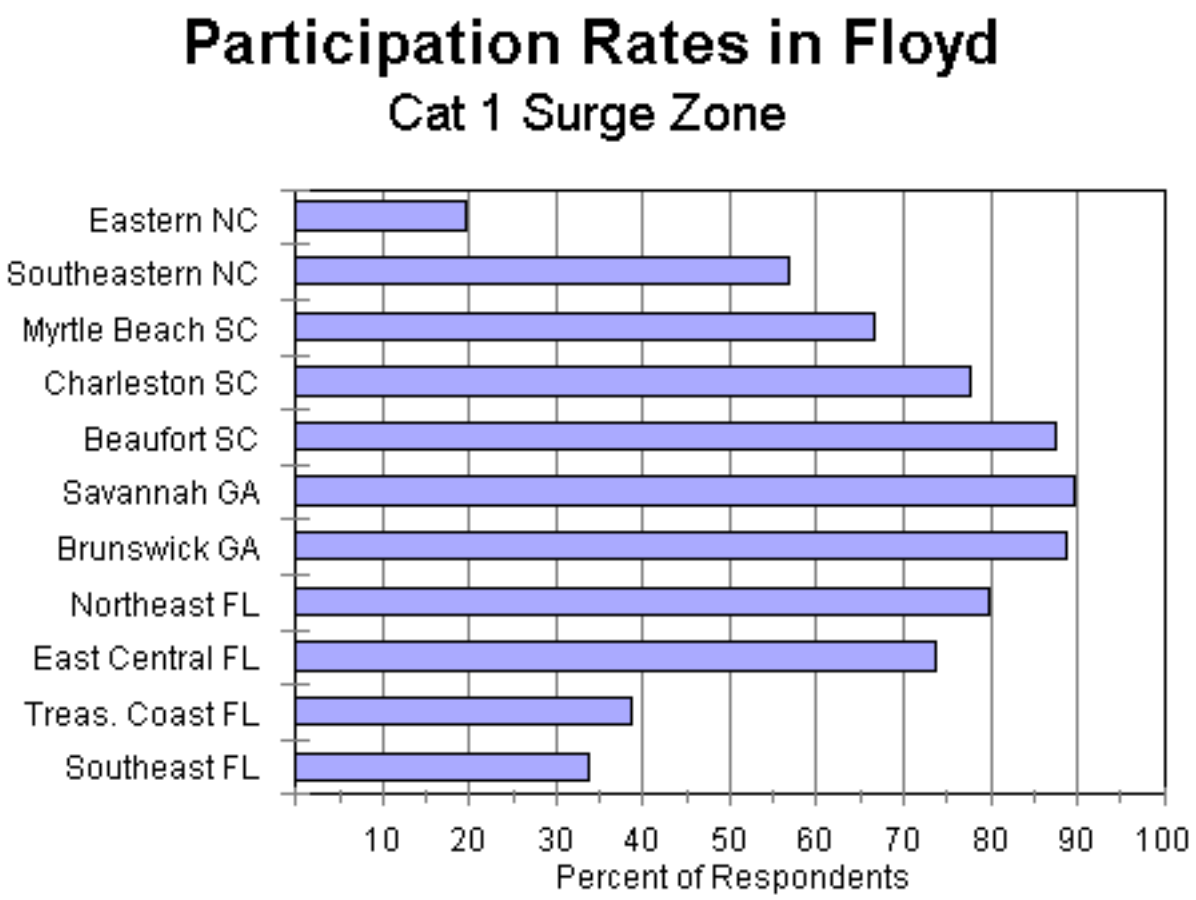

Evacuation Timing in Floyd
Cumulataive Percent of Evacuees
100
90
80
70
60
50
40
30
20
10
0
12A 5A 10A 3P 8P 1A 6A 11A 4P 9P 2A 7A 12P 5P 10P 3A 8A 1P 6P
Sept 13 - Sept 16
EC Fla
Savannah
Myrtle B
Eastern NC

- **Go back**


Participation Rates in Floyd
Cat 1 Surge Zone
Eastern NC
Southeastern NC
Myrtle Beach SC
Charleston SC
Beaufort SC
Savannah GA
Brunswick GA
Northeast FL
East Central FL
Treas. Coast FL
Southeast FL
10
20
30
40
50
60
70
80
90
100
Percent of Respondents

Chapter 8

Public Response to Hurricane Floyd

In the Charleston, South Carolina Region

Prepared by

Earl J. Baker

Hazards Management Group, Inc.

Survey Method

Approximately 600 telephone interviews were conducted in the central conglomerate of South Carolina coastal and adjacent counties in the Charleston region. The sample was stratified as follows:

1. 200 interviews in areas at risk to storm surge in category 1 hurricanes
2. 200 interviews in areas at risk to storm surge in stronger hurricanes
3. 100 interviews in areas of coastal counties not subject to inundation by storm surge
4. 100 interviews in adjacent non-coastal counties.

Evacuation zones maps prepared for the most recent hurricane evacuation study for the region were used to identify the sampling areas. A copy of the generic questionnaire used in the post-Floyd surveys is included as Appendix I.

Statistical Reliability

Figures reported from surveys cited in this report are based upon samples taken from larger populations. The sample values provide estimates of the values of the larger populations from which

the samples were selected, but usually are not precisely the same as the true population values. In general, the larger the number of people in the sample, the closer the sample value will be to the true population value. A sample of 200 will provide estimates which one can be 90% “confident” are within 4 to 6 percentage points of the true populations values, whereas a sample of 100 will provide the same degree of confidence of being within 5 to 8 percentage points of the true population values. With a sample of 50, one can be 90% "confident" of being within 7 to 11 percentage points of the actual population value, and a sample of 25 is 90% "accurate" only within 10 to 17 percentage points. With a sample of 50, one can be 90% "confident" of being within 7 to 12 percentage points of the actual population value. A sample of 25 is 90% "accurate" only within 10 to 17 percentage points.

The ranges (e.g., "10 to 17") stem from the fact that the reliability of an estimate depends not only on the size of the sample but also upon how much agreement there is among the responses. Having 90% of the respondents give a particular answer means almost everyone agreed. By the same reasoning, if only 10% gave a particular response, almost everyone agreed (i.e., 90% disagreed with the 10% but agreed with one another). The maximum disagreement is for the responses to be split 50-50. Thus, if 90% (or 10%) of a sample of 100 give a particular response, that estimate will be within 5 percentage points of the true population value 90% of the time. If 75% (or 25%) of a sample of 100 give a particular response, that estimate will be within 7 percentage points 90% of the time. If 50% of a sample of 100 give a particular response, that estimate will be within 8 percentage points 90% of the time.

Therefore, readers should keep in mind that some estimates provided in this report are more statistically reliable than others. This is particularly noteworthy in drawing conclusions about whether two survey results are "different" from one another. Differences of a few percentage points in sample results of 100 or less do not necessarily mean the populations from which the samples were drawn are different. When the aggregate samples are broken down into subgroups, the reliability of estimates for the subgroups suffers. Tables contain actual sample sizes used to calculate the values reported in the table. Sample sizes vary from table to table because not all questions were asked of all respondents (people who didn’t evacuate weren’t asked where they went, for example), some respondents refused to answer some questions, and in a few cases responses were invalid.

Evacuation Participation Rates

Evacuation, as used in the survey, refers to leaving one’s home to go someplace safer. Approximately 75% evacuated from the surge areas, and even from the non-surge areas of coastal counties (Table 1). The non-surge participation rate was unusually high. There was a pronounced “shadow” evacuation in adjacent non-coastal counties (i.e., evacuation from areas not told by officials to evacuate).

Table 1. Percent who left their homes in Floyd, by risk zone

	Cat 1 Surge Zone N=203	Other Surge Zones N=211	Coastal Non-surge N=99	Non-coastal Counties N=98
Evacuated	78	68	69	49

The plurality of the residents who did not evacuate gave the same reason: they felt their home would be safe enough, given their beliefs about the likely track and strength of the storm (Table 2). Many also observed the heavy traffic and decided not to leave, especially from the coastal counties. Some said they attempted to evacuate but gave up because of the traffic.

Table 2. Why Stayed (Percent of Respondents)

	Cat 1 Surge Zone N=41	Other Surge Zones N=59	Coastal County Non-Surge N=29	Non-coastal Counties N=50
House OK for Storm	49	25	35	63
Officials Said Stay	2			3

Media Said Stay	2	3		
Friends Said Stay	5	2	3	5
Officials Didn't Say Leave	2	2	14	13
Probabilities Low	7	8	17	11
Other Info. Would Miss	2	4	14	

Table 2. Why Stayed (Percent of Respondents) continued

No Transport	2	2		
No Place to Go	2	2		3
Protect from Looters	2			3
Protect from Storm	5	6	7	
Left in Past Miss	15	4	3	

Job	7	10	17	11
Waited Too Long	7	12		
Traffic	24	27	38	8
Tried, Gave Up	5	2	3	
Dangerous on Road	5	6	10	
Pets	2	10	3	3
Required Medical Care		4		
Other	7	15	7	21
Don’t Know		6		3

Jobs were mentioned by some as a reason for not leaving, and respondents were asked specifically whether anyone in their household had to work during Floyd and how that affected their evacuation (Tables 3, 4). One-third said someone in the household had to work, and many said it delayed their departure. Some said it kept at least part of the household from evacuating at all.

Table 3. Someone in Household Had to Work in Floyd

	Cat 1 Surge Zone N=203	Other Surge Zones N=213	Coastal County Non-surge N=99	Non-coastal Counties N=98
Yes	32	32	44	31
No	69	68	56	69

Table 4. How Work Affected Evacuation in Floyd

	Cat 1 Surge Zone N=64	Other Surge Zones N=67	Coastal County Non-surge N=44	Non-coastal Counties N=32
None	38	37	36	62
Kept All from Leaving	3	6	7	4

Kept Part from Leaving	5	8	14	8
Delayed All in Leaving	42	43	34	23
Delayed Part in Leaving	11	5	2	
Other	2	2	7	4

Those who didn't evacuate were asked whether they would have left had they been convinced the storm was going to strike, and more than a third said they would have (Table 5). Most also said they had made the necessary preparations to leave in case conditions worsened (Table 6).

Table 5. Stayers Who Say They Would Have Left If Convinced Storm Was Going to Hit

	Cat 1 Surge Zone N=42	Other Surge Zones N=59	Coastal County Non-surge N=31	Non-coastal Counties N=52
Would Have Left	38	39	39	40
Wouldn't Have Left	43	51	39	51
Don't Know	14	11	19	9
Other	5		4	

Table 6. Stayers Who Say They Had Made Necessary Preparations to Leave

	Cat 1 Surge Zone N=42	Other Surge Zones N=59	Coastal County Non-surge N=31	Non-coastal Counties N=52
Had Prepared	62	57	62	56
Hadn't Prepared	38	43	39	42
Don't Know				2

Evacuees were asked what convinced them to leave, and most indicated some combination of response to actions by public officials (including the NWS) and concern about storm conditions (Table 7.) Friends and the media played slightly lesser roles.

Table 7. Why Evacuees Left (Percent of Respondents)

	Cat 1 Surge Zone N=159	Other Surge Zones N=143	Coastal County Non-surge N=63	Non-coastal Counties N=46
Officials Said Leave	40	30	25	17

NWS Said Leave	11	17	16	17
Police/Fire Said Leave	3	5	2	2
Media Said Leave	19	11	30	12
Friend Said Leave	8	14	16	20
Storm Severe	33	34	33	39
Heard “Bad as Hugo/Andrew”	16	20	16	20
Increased in Strength	4	3	6	
Concerned about Flooding	10	11	10	
Concerned about Winds	2	10	16	12
Concerned re. Road Flooding	2	2		
Probability of Hit	9	11	9	9

Post-Storm Concerns	3	2		
Other	6	11	16	26
Don't Know		3	2	

In an attempt to separate the effect of messages disseminated by government officials via the media from the effect of other information heard via the media, respondents were asked which had the greater impact on their decision to evacuate. Information from officials had the greater impact, according to respondents (Table 8).

Table 8. Greatest Influence to Leave (Percent of Respondents)

	Cat 1 Surge Zone N=157	Other Surge Zones N=143	Coastal County Non-surge N=66	Non-coastal Counties N=45
Media Info from Gov't Officials	60	63	46	70
Other Media Info	31	23	32	23

Info from Friends	7	7	9	8
Other	9	6	18	5
Don't Know	2	1	3	3

Interviewees were also asked whether they heard from officials – either directly or indirectly – that they should evacuate. A majority in the coastal counties and half in the non-coastal counties said they did (Table 9). People who heard evacuation notices were more likely than others to evacuate, especially if they thought the evacuation notice was mandatory (Table 10).

Table 9. Heard Evacuation Notices from Officials

	Cat 1 Surge Zone N=203	Other Surge Zones N=210	Coastal County Non-Surge N=99	Non-coastal Counties N=99
Heard Notices	79	77	70	49
Didn't Hear	20	22	26	50
Don't Know	1	1	4	2

Table 10. Evacuation Participation Rates, by Hearing Evacuation Notices from Officials (Sample size varies by cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Heard Must	86	82	81	71
Heard Should	74	56	80	63
Didn't Hear	68	59	46	29

Many residents of the study area, even in surge areas, believe they would be safe in a 125 MPH hurricane in their own homes (Table 11a). In all four risk zones people who perceived their homes to be vulnerable were substantially more likely than others to evacuate (Table 11b).

Table 11a. Perceived Safety of Home from Wind and Water in 125 MPH Hurricane

	Cat 1 Surge Zone N=203	Other Surge Zones N=210	Coastal County Non-Surge N=99	Non-coastal Counties N=99
Safe	32	41	41	44
Unsafe	59	52	49	43
Don't Know	9	7	10	12

Table 11b. Evacuation Participation Rates, by Perceived Safety in 125 MHP Storm (See previous table for sample sizes for each cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Safe	62	49	51	30
Unsafe	89	82	83	64
Don't Know	67	67	70	50

Evacuation Timing

Evacuation departures were fairly gradual, primarily during September 14 and 15, with the steepest portion of the response on the 14th. By the end of the day of the 14th 70% of the evacuees had left. A hurricane watch was issued for Charleston at 11 PM on the 13th, followed by a warning at 5 PM on the 14th.

Use of Public Shelters and Other Refuges

The great majority of evacuees went to the homes of friends and relatives or to hotels and motels (Table 12). Only one to two percent said they went to public shelters.

Table 12. Refuges Uses by Evacuees

	Cat 1 Surge Zone N=159	Other Surge Zones N=143	Coastal County Non-Surge N=64	Non-coastal Counties N=46
Public Shelter	1	1	2	2
Church		2	2	
Friend/Relative	59	64	64	61
Hotel/Motel	31	27	28	32
Workplace	1	1	2	
Other	8	4	3	5

Destination and Transportation Issues

Almost all evacuees left their own county, going elsewhere in South Carolina, North Carolina, and Georgia (Tables 13, 14). These are much higher out-of-county destinations than normally observed in hurricane evacuations and higher than in past evacuations in South Carolina. At least some of the coastal counties in parts of South Carolina issued evacuation notices for the entire county.

Table 13. Percent of evacuees by destination, by risk zone

	Cat 1 Surge Zone N=159	Other Surge Zones N=147	Coast Non-Surge N=70	Non-Coastal Counties N=46
Own Neighborhood	3	7	1	5
Own County	6	6	4	2
Out of County	91	87	95	93

Table 14. Percent of out-of-county evacuees, by state destination

Florida	<1
Georgia	17
South Carolina	45
North Carolina	25
Virginia	2
Alabama	2
Tennessee	5
Other	3

Going out of county was prompted by three main factors: the strength of the storm, the location of friends and family, and the lack of closer motels (Table 15). As noted above, entire counties were told to evacuate by officials. Information from government officials conveyed by the media was a larger

influence than other media information (Table 16).

Table 15. Why Went Out of County

	Cat 1 Surge Zone N=145	Other Surge Zone N=125	Coastal County Non-surge N=65	Non-coastal Counties N=42
Strength of Storm	32	38	28	18
Previous Hurri-cane Experience	6	14	7	13
Comparisons to Hugo/Andrew	6	10	7	10
Officials Said Leave County	3	7	3	

Media Said Leave County	6	3	2	
Friend Said Leave County	6	12	12	16
Friend Lives in Destination	52	44	48	45
No Public Shelter Closer	1	3	2	2
No Motels Closer	15	16	22	21
Other	9	9	7	8
Don't Know	1	2		5

Table 16. Greatest Influence for Going Out of County

	Cat 1 Surge Zone N=145	Other Surge Zones N=126	Coastal County Non-surge N=64	Non-coastal Counties N=42
Media Info from Gov't Officials	50	56	34	60
Other Media Info	26	18	22	24
Info from Friends	9	18	25	16

Other	14	10	20	16
Don't Know	2	1	3	

Approximately 80% of the evacuees from most risk areas eventually reached their destinations (Table 17). Of those who changed destinations, some went someplace farther than anticipated and some went someplace closer (Table 18). Traffic, location of refuge, and fatigue were the main reasons for changing destinations (Table 19).

Table 17. Whether Reached Original Destination

	Cat 1 Surge Zone N=159	Other Surge Zones N=143	Coastal County Non-surge N=68	Non-coastal Counties N=46
Yes	83	80	77	83
No	17	20	24	17

Table 18. Proximity of New Destination, Compared to Original Destination

	Cat 1 Surge Zone N=27	Other Surge Zones N=31	Coastal County Non-surge N=17	Non-coastal Counties N=8
Farther	30	26	53	63
Closer	59	58	41	25
Same	11	13	6	13
Don't Know		3		

Table 19. Why Changed Destination

	Cat 1 Surge Zone N=27	Other Surge Zones N=29	Coastal County Non-surge N=15	Non-coastal Counties N=8
Traffic	56	83	35	33
Better Route		7		
Loc. of Refuge	22	14	47	67
Out of Gas		3		
Tired	19	14		
Hungry				
Bathroom	4			

Storm Strengthened	7	3		
Storm Close		10		
Other	26	10	18	33
Don't Know	7	3		

Most people from coastal counties said they heard about traffic problems on evacuation routes before leaving home (Table 20). Of those who heard about such problems before leaving, most changed their evacuation route plans (Table 21).

Table 20. Heard About Evacuation Route Problems Before Leaving Home

	Cat 1 Surge Zone N=159	Other Surge Zones N=142	Coastal County Non-surge N=61	Non-coastal Counties N=46
Yes	55	58	59	49
No	45	42	39	51

Don’t Know		1	2	

Table 21. Changed Routes Because of Information Heard Before Leaving Home

	Cat 1 Surge Zone N=87	Other Surge Zones N=82	Coastal County Non-surge N=36	Non-coastal Counties N=20
Yes	56	54	58	60
No	43	46	42	40
Don’t Know	1			

Those who said they had heard about evacuation problems before leaving home were also asked whether they heard about such problems after leaving home. Most said they did (Table 22), but most of them did not change their route plans accordingly (Table 23).

Table 22. Heard About Evacuation Route Problems After Leaving Home

	Cat 1 Surge Zone N=87	Other Surge Zone N=80	Coastal County Non-surge N=36	Non-coastal Counties N=20
Yes	61	56	50	70

No	39	44	50	30
Don't Know				

Table 23. Changed Routes Because of Information Heard After Leaving Home

	Cat 1 Surge Zone N=53	Other Surge Zones N=45	Coastal County Non-surge N=18	Non-coastal Counties N=14
Yes	51	40	44	36
No	49	60	56	64
Don't Know				

Most evacuees from coastal counties used interstate highways for at least part of their evacuation (Table 24). Most from non-coastal counties did not. Those who used interstates in Floyd gave a mixture of future intentions concerning road use, but the overall tendency appeared to be flexibility, depending upon the circumstances (Table 25). More than 70% of the respondents from most areas said they were familiar with the roads in the area through which they evacuated (Table 26). Approximately 60% to 75% also said they would be willing to use a different route than they would normally use if government officials urged them to do so to avoid congestion, even if the route took them out of their way (Table 27). In most areas only about 10% said they would be unwilling to comply with that sort of request by officials.

Table 24. Used Interstate for at Least Part of Route

	Cat 1 Surge Zone N=158	Other Surge Zones N=140	Coastal County Non-surge N=61	Non-coastal Counties N=46
Yes	53	53	61	44
No	47	46	39	56
Don't Know		1		

Table 25. Routes to be Used in the Future

	Cat 1 Surge Zone N=84	Other Surge Zones N=76	Coastal County Non-surge N=37	Non-coastal Counties N=18
Interstate	35	26	38	33
Secondary Roads	30	41	32	56
Both	5	9		11
Depends on Traffic	14	5	14	
Depends on Other	8	11	11	
Other	4	3		
Don't Know	5	5	5	

Table 26. Familiar with Roads in Area

	Cat 1 Surge Zone N=159	Other Surge Zones N=143	Coastal County Non-surge N=61	Non-coastal Counties N=46
Yes	74	71	62	78
No	26	25	38	22
Don't Know		4		

Table 27. Would Use Routes Advised by Officials, Even if Longer

	Cat 1 Surge Zone N=159	Other Surge Zones N=143	Coastal County Non-surge N=61	Non-coastal Counties N=46
Yes	72	69	57	76
No	11	11	18	7
Depends How Much Longer	1	6	5	2
Depends on Other	10	11	15	12
Other	1		2	
Don't Know	5	5	3	2

More than two-thirds of the respondents said it took them more than five hours to reach their destination, and more than a third said it took 10 or more hours (Table 28). Non-coastal counties and surge zones outside the category 1 zone had lower times than the other two risk areas. Anticipated evacuation travel times were much lower than actual (Table 29). When asked how long it was reasonable for an evacuation like Floyd's to take, most respondents gave times shorter than the actual evacuation but slightly longer than their original expectation (Table 30).

Table 28. Hours Required to Reach Destination

	Cat 1 Surge Zone N=159	Other Surge Zones N=143	Coastal County Non-surge N=67	Non-coastal Counties N=45
Less than 2	9	14	9	15

2 to 5	17	22	10	13
5 to 10	31	30	24	45
10 to 15	25	19	33	15
15 to 20	9	12	18	12
20 or more	9	3	6	0
Mean No. Hrs	9.3	8.0	10.1	7.7
Median No. Hrs	8.0	7.0	10.0	7.0

Table 29. Hours Expected to Reach Destination

	Cat 1 Surge Zone N=158	Other Surge Zones N=136	Coastal County Non-surge N=67	Non-coastal Counties N=45
Less than 2	14	21	12	18
2 to 5	49	47	28	47
5 to 10	33	30	44	30
10 to 15	3	2	16	5
15 to 20	1	0	0	0
20 or more	0	0	0	0
Mean No. Hrs	4.1	3.8	5.7	4.2

Median No. Hrs	4.0	3.5	5.5	4.0

Table 30. Hours Reasonable to Reach Destination

	Cat 1 Surge Zone N=155	Other Surge Zones N=130	Coastal County Non-surge N=65	Non-coastal Counties N=45
Less than 2	11	16	9	15
2 to 5	32	38	23	35
5 to 10	52	42	45	40
10 to 15	5	4	22	8
15 to 20	0	0	1	2
20 or more	0	0	0	0
Mean No. Hrs	5.2	4.5	6.7	4.8
Median No. Hrs	5.0	4.3	7.0	4.3

Most people thought the traffic delays were caused mainly by the sheer volume of traffic and the fact that too many people left at once (Table 31). Many also cited poor traffic management and advocated reversing lane directions. The great majority of respondents said they would be willing to cooperate in a phased evacuation in which they would delay their departure for a few hours until people in a more dangerous location had begun their evacuation (Table 32).

Table 31. Why Traffic Was Slow

	Cat 1 Surge Zone N=159	Other Surge Zones N=144	Coastal County Non-surge N=67	Non-coastal Counties N=41
Number of Cars	60	66	51	51
All Left at Once	31	46	25	51
Waited too Long	3	10	5	6
Construction	1	3	3	3
Accidents	4	6	13	11
Poor Traffic Management	45	42	43	31
Need Reverse Lanes	20	14	28	11

Bad Weather	1	3		3
Other	13	9	20	9
Don't Know	8	6	10	14

Table 32. Would Delay Departure if Urged by Officials

	Cat 1 Surge Zone N=203	Other Surge Zones N=213	Coastal County Non-surge N=99	Non-coastal Counties N=98
Yes	81	76	73	86
Depends on Storm's Proximity	3	6	5	2
Depends on Storm's Strength	2	2	2	5
Other	1	2	1	
Don't Know	5	5	7	4
No	8	9	12	4

Most evacuees did not cite specific difficulties experienced during the evacuation. Needing restroom facilities was most common, but a few ran out of gas or had mechanical breakdowns (Table 33). Almost half the evacuees said they heard about places where they could find shelter if they weren't

able to reach their destinations (Table 34). Few changed their plans about seeking shelter as a result (Table 35). Most interviewees reported no difficulties returning from the evacuation (Table 36).

Table 33. Difficulties Experienced in Evacuation

	Cat 1 Surge Zone N=159	Other Surge Zones N=144	Coastal County Non-surge N=68	Non-coastal Counties N=46
Ran Out of Gas	3	4	2	3
Car Broke Down	3	3	2	3
Needed Water	4	13	3	3
Needed Food	5	11	3	9
Needed Restroom	15	25	21	20
Other Difficulties	1	1	2	6
No Difficulties	80	69	75	74

Table 34. Heard About Refuge Options After Leaving Home

	Cat 1 Surge Zone N=159	Other Surge Zones N=143	Coastal County Non-surge N=61	Non-coastal Counties N=46
Yes	40	42	41	51
No	54	55	57	46
Don't Know	6	4	2	2

Table 35. Changed Plans Because of Refuge Information Heard After Leaving Home

	Cat 1 Surge Zone N=63	Other Surge Zones N=59	Coastal County Non-surge N=25	Non-coastal Counties N=20
Yes	2	3	8	
No	98	97	92	100
Don't Know				

Table 36. Difficulties Experienced Returning from Evacuation

	Cat 1 Surge Zone N=159	Other Surge Zones N=144	Coastal County Non-surge N=61	Non-coastal Counties N=46
Lack of Information	1		2	3
Roads Blocked	1	4	2	3
Traffic Congested	4	8	12	11
Re-entry Not Permitted	1		2	
Other Difficulties	1	1	3	
No Difficulties	94	89	84	83

Vehicle use was consistent with most evacuations, in which 65% to 75% of the available vehicles are used (Table 37). Few households required assistance in evacuating, and in most instances outside agencies were not required (Table 38).

Table 37. Vehicle Use by Evacuating Households

	Cat 1 Surge Zone N=157	Other Surge Zones N=144	Coastal County Non-surge N=67	Non-coastal Counties N=45

Percent of Available	67	64	58	65
Avg. Number Per Household	1.32	1.36	1.28	1.38
Pulled Trailer, Took Motorhome	6	2	3	5

Table 38. Required Assistance in Evacuating (As a Percent of All Households)

	Cat 1 Surge Zone N=203	Other Surge Zones N=211	Coastal County Non-surge N=99	Non-coastal Counties N=98
Yes, Within Household	3	2	3	
Yes, Friend/ Relative	2	1		
Yes, Agency				
No	95	97	97	100

Local television was relied upon most heavily by the respondents for information about Floyd, followed by The Weather Channel (Table 39). Local radio was the third most relied-upon source of information.

Table 39. Relied On a Great Deal for Information about Floyd

	Cat 1 Surge Zone N=203	Other Surge Zones N=213	Coastal County Non-surge N=99	Non-coastal Counties N=98
Local Radio	29	38	38	31
Local Television	68	72	76	80
CNN	12	19	13	10
Weather Channel	55	47	45	45
Other Cable	2	6	5	0
Internet	11	9	6	6
AOL	5	5	3	1
Word of Mouth	5	10	8	14

Many (but not most) respondents in the sample said if faced with the same circumstances again as in Floyd they would either leave earlier or not at all (Table 40). Some would seek a different evacuation route.

Table 40. Would Do Differently Next Time

	Cat 1 Surge Zone N=200	Other Surge Zones N=211	Coastal County Non-surge N=99	Non-coastal Counties N=99
Would Leave	2	7	3	3

Wouldn’t Leave	20	12	20	12
Leave Earlier	18	30	26	12
Leave Later	7	5	1	14
Go Farther	2	2		4
Go Closer	3	1	1	1
Use Public Shelter		1		
Not Use Pub Shltr	1			
Different Route	8	15	9	5
Buy Gasoline		1		3
Take Provisions	2	4	2	3
Other	4	6	6	8
Don’t Know	3	4	2	4
Nothing Different	46	44	42	61

Chapter 4

Public Response to Hurricane Floyd

In Northeast Florida

Prepared by

Earl J. Baker

Hazards Management Group, Inc.

Survey Method

Approximately 600 telephone interviews were conducted in the seven counties of the Northeast Florida Regional Planning Council (Nassau, Duval, St. Johns, Flagler, Clay, Putnam, and Baker). The sample was stratified as follows:

1. 200 interviews in areas at risk to storm surge in category 1 hurricanes

2. 200 interviews in areas at risk to storm surge in stronger hurricanes

3. 100 interviews in areas of coastal counties not subject to inundation by storm surge

4. 100 interviews in non-coastal counties.

Evacuation zones defined in the most recent hurricane evacuation study for the region were used to identify the sampling areas. In Flagler the category 1 and 2 evacuation zones are the same. A copy of the questionnaire is included as Appendix I.

Statistical Reliability

Figures reported from surveys cited in this report are based upon samples taken from larger populations. The sample values provide estimates of the values of the larger populations from which the samples were selected, but usually are not precisely the same as the true population values. In general, the larger the number of people in the sample, the closer the sample value will be to the true population value. A sample of 200 will provide estimates which one can be 90% “confident” are within 4 to 6 percentage points of the true populations values, whereas a sample of 100 will provide the same degree of confidence of being within 5 to 8 percentage points of the true population values. With a sample of 50, one can be 90% "confident" of being within 7 to 11 percentage points of the actual population value, and a sample of 25 is 90% "accurate" only within 10 to 17 percentage points. With a sample of 50, one can be 90% "confident" of being within 7 to 12 percentage points of the actual population value. A sample of 25 is 90% "accurate" only within 10 to 17 percentage points.

The ranges (e.g., "10 to 17") stem from the fact that the reliability of an estimate depends not only on the size of the sample but also upon how much agreement there is among the responses. Having 90% of the respondents give a particular answer means almost everyone agreed. By the same reasoning, if only 10% gave a particular response, almost everyone agreed (i.e., 90% disagreed with the 10% but agreed with one another). The maximum disagreement is for the responses to be split 50-50. Thus, if 90% (or 10%) of a sample of 100 give a particular response, that estimate will be within 5 percentage points of the true population value 90% of the time. If 75% (or 25%) of a sample of 100 give a particular response, that estimate will be within 7 percentage points 90% of the time. If 50% of a sample of 100 give a particular response, that estimate will be within 8 percentage points 90% of the time.

Therefore, readers should keep in mind that some estimates provided in this report are more statistically reliable than others. This is particularly noteworthy in drawing conclusions about whether two survey results are "different" from one another. Differences of a few percentage points in sample results of 100 or less do not necessarily mean the populations from which the samples were drawn are different. When the aggregate samples are broken down into subgroups, the reliability of estimates for the subgroups suffers. Tables contain actual sample sizes used to calculate the values reported in the table. Sample sizes vary from table to table because not all questions were asked of all respondents (people who didn't evacuate weren't asked where they went, for example), some respondents refused to answer some questions, and in a few cases responses were invalid.

Evacuation Participation Rates

Evacuation, as used in the survey, refers to leaving one's home to go someplace safer. In the category 1 risk zone, 80% evacuated (Table 1). Emergency management officials in the largest county, Duval, ordered evacuation for the area east of the intracoastal waterway, which did not include category 1 risk areas along the St. Johns river in our sample. That might have accounted for part of the reason the participation rate was no higher. The "shadow" evacuation in other risk areas (i. e., evacuation from areas not told by officials to evacuate) was substantial, no doubt accounting for much of the evacuating traffic.

Table 1. Percent who left their homes in Floyd, by risk zone

	Cat 1 Surge Zone N=203	Other Surge Zones N=201	Coastal Non-surge N=100	Non-Coastal Counties N=103

Evacuated	80	44	30	24

Most of the residents who did not evacuate gave the same reason: they felt their home would be safe, given the likely track and strength of the storm (Table 2). Some apparently observed the heavy traffic and decided not to leave. Some said they attempted to evacuate but gave up because of the traffic.

Table 2. Why Stayed (Percent of Respondents)

	Cat 1 Surge Zone N=41	Other Surge Zones N=103	Coastal County Non-Surge N=69	Non-coastal Counties N=77
House OK for Storm	51	55	59	58
Officials Said Stay	7	4	2	3
Media Said Stay		3		1
Friends Said Stay		4	5	
Officials Didn't Say Leave	7	9	7	7
Probabilities Low	2	14	15	22

Table 2. Why Stayed (Percent of Respondents) continued

Other Info. Would Miss	5	14		11
No Place to Go	5	2	3	1
Protect from Looters	5		2	1
Protect from Storm	2	4	2	3
Left in Past Miss	7	6	3	
Job		6	7	3
Waited Too Long		1	2	
Traffic	20	13	14	13
Tried, Gave Up	12	4	3	1
Dangerous on Road	7	2	2	
Pets	7	6	2	1
Required Medical Care		1	3	1
Other	7	15	10	4
Don’t Know	5	6		3

Respondents were asked specifically whether anyone in their household had to work during Floyd

and how that affected their evacuation (Tables 3, 4). At least a fourth said someone in the household had to work, and some said it either prevented some in the household from evacuating or delayed their departure.

Table 3. Someone in Household Had to Work in Floyd

	Cat 1 Surge Zone N=203	Other Surge Zones N=201	Coastal County Non-surge N=100	Non-coastal Counties N=105
Yes	26	23	28	35
No	74	77	72	65

Table 4. How Work Affected Evacuation in Floyd

	Cat 1 Surge Zone N=53	Other Surge Zones N=43	Coastal County Non-surge N=28	Non-coastal Counties N=37
None	40	54	65	60

Kept All from Leaving	4	5	8	27
Kept Part from Leaving	13	12	9	3
Delayed All in Leaving	32	19	17	5
Delayed Part in Leaving	6	2		5
Other	6	7		

Those who didn't evacuate were asked whether they would have left had they been convinced the storm was going to strike, and most said they would have (Table 5). Most also said they had made the necessary preparations to leave in case conditions worsened (Table 6).

Table 5. Stayers Who Say They Would Have Left If Convinced Storm Was Going to Hit

	Cat 1 Surge Zone N=41	Other Surge Zones N=111	Coastal County Non-surge N=69	Non-coastal Counties N=84
Would Have Left	76	60	61	67
Wouldn't Have Left	12	26	32	20
Don't Know	10	13	7	1
Other	2	1		11

Table 6. Stayers Who Say They Had Made Necessary Preparations to Leave

	Cat 1 Surge Zone N=41	Other Surge Zones N=111	Coastal County Non-surge N=69	Non-coastal Counties N=83
Had Prepared	83	65	64	71
Hadn't Prepared	17	34	32	28
Don't Know			3	1

Evacuees were asked what convinced them to leave, and most indicated some combination of response to actions by public officials and concern about storm conditions (Table 7.)

Table 7. Why Left (Percent of Respondents)

	Cat 1 Surge Zone N=163	Other Surge Zones N=87	Coastal County Non-surge N=28	Non-coastal Counties N=26
Officials Said Leave	41	31	13	19
NWS Said Leave	20	27	4	4
Police/Fire Said Leave	16	6	4	8
Media Said Leave	14	20	13	23

Friend Said Leave	7	15	17	4
Storm Severe	34	32	39	54
Heard “Bad as Hugo/Andrew”	3	4		8
Increased in Strength	1	2		
Concerned about Flooding	8	11	9	12
Concerned about Winds	9	16	22	50
Concerned re. Road Flooding	1	5		4
Probability of Hit	14	15	4	19
Post-Storm Concerns	1	1	9	4
Other	12	16	9	19
Don’t Know	1	1		

In an attempt to separate the effect of messages disseminated by government officials via the media from the effect of other information heard via the media, respondents were asked which had the greater impact on their decision to evacuate. Information from officials had the greater impact, according to respondents (Table 8).

Table 8. Greatest Influence to Leave (Percent of Respondents)

	Cat 1 Surge Zone N=164	Other Surge Zones N=84	Coastal County Non-surge N=26	Non-coastal Counties N=24
Gov't Officials Info via Media	58	49	33	63
Other Media Info	33	33	14	21
Info from Friends	14	17	38	4
Other	11	11	24	21
Don't Know	1			

Interviewees were also asked whether they heard from officials – either directly or indirectly – that they should evacuate. Only in the category 1 risk area did a majority say they did (Table 9). Those who did hear evacuation notices were more likely than others to evacuate (Table 10). In the category 1 risk area, 97% of those who said they heard mandatory evacuation orders evacuated.

Table 9. Heard Evacuation Notices from Officials

	Cat 1 Surge Zone N=205	Other Surge Zones N=201	Coastal County Non-Surge N=100	Non-coastal Counties N=107

Heard Notice	68	41	25	16
Didn't Hear	31	57	72	82
Don't Know	2	2	3	3

Table 10. Evacuation Participation Rates, by Hearing Evacuation Notices from Officials (Sample size varies by cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Heard Must	97	84	60	67
Heard Should	69	50	61	64
Didn't Hear	59	27	16	14

A majority of people living in all four risk areas believe they would be unsafe in a 125 MPH hurricane in their own homes (Table 11a). In all four risk zones people who perceived their homes to be vulnerable were more likely than others to evacuate (Table 11b).

Table 11a. Perceived Safety of Home from Wind and Water in 125 MPH Hurricane

	Cat 1 Surge Zone N=203	Other Surge Zones N=201	Coastal County Non-Surge N=100	Non-coastal Counties N=103
Safe	18	25	40	27
Unsafe	76	60	50	57

Don't Know	6	15	10	16

Table 11b. Evacuation Participation Rates, by Perceived Safety in 125 MHP Storm (See previous table for sample sizes for each cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Safe	72	26	15	10
Unsafe	84	58	44	37
Don't Know	54	23	10	0

Evacuation Timing

Evacuation departures were fairly gradual, primarily during September 13 and 14, with the steepest portion of the response on the 14th. Forty percent of the eventual evacuees had left by 8 AM on the 14th. A hurricane watch was issued for the area at 11 AM on the 13th, followed by a warning at 5 PM later that day.

Use of Public Shelters and Other Refuges

The great majority of evacuees went to the homes of friends and relatives or to hotels and motels (Table 12). Only in the non-category 1 surge zone did more than five percent of those interviewed say they went to public shelters.

Table 12. Types of refuge used (percent of evacuees)

	Cat 1 Surge Zone N=163	Other Surge Zones N=89	Coastal County Non-Surge N=24	Non-coastal Counties N=25
Public Shelter	4	9	4	4
Church	1	3	0	4
Friend/Relative	51	47	63	52
Hotel/Motel	32	30	25	24
Workplace	3	2	0	0
Other	10	8	4	16

Evacuation Destinations and Transportation Issues

Most evacuees left their own county, going elsewhere in Florida, with a third going into Georgia (Tables 13, 14). The roughly 75% out-of-county evacuation was slightly higher than normal for the region.

Table 13. Percent of evacuees by destination, by risk zone

	Cat 1 Surge Zone	Other Surge Zones	Coast Non-Surge	Non-Coastal Counties
Own Neighborhood	5	13	11	31
Own County	20	9	15	15
Out of County	75	78	74	54

Table 14. Percent of out-of-county evacuees, by state destination

Florida	55
Georgia	32
South Carolina	1
North Carolina	4
Virginia	
Alabama	7
Tennessee	<1
Other	<1

Going out of county (beyond the surge inundation limits) was motivated by three main factors: the strength of the storm, the location of friends and family, and the lack of closer motels (Table 15). Information from government officials conveyed by the media was a larger influence than other media information (Table 16).

Table 15. Why Went Out of County (percent of evacuees)

	Cat 1 Surge Zone N=121	Other Surge Zone N=66	Coastal County Non-surge N=18	Non-coastal Counties N=14
Strength of Storm	58	35	28	29
Previous Hurri-cane Experience	3	15	11	14
Comparisons to Hugo/Andrew	2	3	6	7
Officials Said Leave County	4	6		
Media Said Leave County	1	5		
Friend Said Leave County	8	11	6	
Friend Lives in Destination	34	35	44	43
No Public Shelter Closer	10	6		
No Motels Closer	36	26	17	43

Other	16	12	22	14
Don't Know	1	2		14

Table 16. Greatest Influence for Going Out of County

	Cat 1 Surge Zone N=122	Other Surge Zones N=65	Coastal County Non-surge N=18	Non-coastal Counties N=14
Media Info from Gov't Officials	51	46	39	71
Other Media Info	23	23	17	21
Info from Friends	22	15	39	7
Other	14	19	17	14
Don't Know	3	2		

At least 75% of the evacuees from most risk areas eventually reached their destinations (Table 17). Of those who changed destinations, about half went someplace closer than anticipated and half when farther (Table 18). Traffic was the main reason for changing destinations (Table 19).

Table 17. Whether Reached Original Destination (percent)

	Cat 1 Surge Zone N=163	Other Surge Zones N=84	Coastal County Non-surge N=24	Non-coastal Counties N=27
Yes	78	80	79	56
No	20	19	17	41
Don't Know	2	1	4	4

Table 18. Proximity of New Destination, Compared to Original Destination (percent)

	Cat 1 Surge Zone N=33	Other Surge Zones N=16	Coastal County Non-surge N=4	Non-coastal Counties N=11
Farther	52	56	50	46
Closer	46	25	50	54
Same	3	13		
Don't Know		6		

Table 19. Why Changed Destination (percent)

	Cat 1 Surge Zone N=32	Other Surge Zones N=17	Coastal County Non-surge N=4	Non-coastal Counties N=9

Traffic	47	29	50	67
Loc. of Refuge	31	50	25	56
Out of Gas	6	7		
Tired	16	14		11
Bathroom	3			
Storm Close	3	14	25	
Other	34		25	33
Don't Know				22

Most people said they did not hear about traffic problems on evacuation routes before leaving home (Table 20). Of those who heard about such problems before leaving home, most did not change their evacuation route plans (Table 21).

Table 20. Heard About Evacuation Route Problems Before Leaving Home (percent)

	Cat 1 Surge Zone N=164	Other Surge Zones N=85	Coastal County Non-surge N=24	Non-coastal Counties N=27
Yes	34	33	58	44
No	64	64	42	52
Don't Know	2	4		4

Table 21. Changed Routes Because of Information Heard Before Leaving Home

	Cat 1 Surge Zone N=56	Other Surge Zones N=28	Coastal County Non-surge N=14	Non-coastal Counties N=12
Yes	45	39	21	17
No	55	61	79	83
Don't Know				

Those who said they had heard about evacuation problems before leaving home were also asked whether they heard about such problems after leaving home. Two-thirds said they did (Table 22). About a third of those changed their route plans accordingly (Table 23).

Table 22. Heard About Evacuation Route Problems After Leaving Home

	Cat 1 Surge Zone N=56	Other Surge Zone N=28	Coastal County Non-surge N=14	Non-coastal Counties N=12
Yes	63	68	64	67
No	36	32	36	33
Don't Know	2			

Table 23. Changed Routes Because of Information Heard After Leaving Home

	Cat 1 Surge Zone N=35	Other Surge Zones N=19	Coastal County Non-surge N=9	Non-coastal Counties N=8
Yes	37	32	33	25
No	63	68	67	75
Don't Know				

Most evacuees used interstate highways for at least part of their evacuation (Table 24). Those who used interstates in Floyd gave a mixture of future intentions concerning road use, but the overall tendency appeared to be flexibility, depending upon the circumstances (Table 25). More than 75% of the respondents said they were familiar with the roads in the area through which they evacuated (Table 26). Three-fourths also said they would be willing to use a different route than they would normally use if government officials urged them to do so to avoid congestion, even if the route took them out of their way (Table 27). Only about 10% said they would be unwilling to comply with that sort of request by officials.

Table 24. Used Interstate for at Least Part of Route

	Cat 1 Surge Zone N=163	Other Surge Zones N=84	Coastal County Non-surge N=24	Non-coastal Counties N=26
Yes	52	45	67	46
No	45	54	33	54
Don't Know	3	1		

Table 25. Routes to be Used in the Future

	Cat 1 Surge Zone N=85	Other Surge Zones N=38	Coastal County Non-surge N=16	Non-coastal Counties N=12
Interstate	45	34	44	42
Secondary Roads	26	18	13	17
Both	9	21	13	8
Depends on Traffic	6	13	13	8
Depends on Other	9	8	6	17
Other	1	3		
Don't Know	2	3	13	8

Table 26. Familiar with Roads in Area

	Cat 1 Surge Zone N=164	Other Surge Zones N=85	Coastal County Non-surge N=24	Non-coastal Counties N=27
Yes	88	78	79	82
No	10	20	21	19
Don't Know	2	2		

Table 27. Would Use Routes Advised by Officials, Even if Longer

	Cat 1 Surge Zone N=164	Other Surge Zones N=85	Coastal County Non-surge N=24	Non-coastal Counties N=26
Yes	77	73	67	77
No	9	5	17	8
Depends How Much Longer	5	5	4	4
Depends on Other	6	14	8	8
Other	2			4
Don't Know	2	4	4	

Almost half the respondents said it took them more than five hours to reach their destination, and about 15% said it took ten or more hours (Table 28). Only 20% to 30% expected the evacuation to take more than five hours, and fewer than five percent expected it to take ten or more (Table 29). When asked how long it was reasonable for an evacuation like Floyd's to take, most respondents gave times shorter than the actual evacuation but slightly longer than their original expectation (Table 30).

Table 28. Hours Required to Reach Destination

	Cat 1 Surge Zone N=157	Other Surge Zones N=81	Coastal County Non-surge N=24	Non-coastal Counties N=24
Less than 2	38	25	25	38
2 to 5	21	36	25	34
5 to 10	29	23	38	21
10 or more	13	16	12	8
Mean No. Hrs	4.6	4.8	5.4	3.9
Median No. Hrs	3.0	3.0	4.8	2.5

Table 29. Hours Expected to Reach Destination

	Cat 1 Surge Zone N=147	Other Surge Zones N=81	Coastal County Non-surge N=24	Non-coastal Counties N=24
Less than 2	45	41	26	44
2 to 5	35	46	44	30
5 to 10	19	10	30	26
10 or more	1	3	0	0
Mean No. Hrs	3.0	2.7	3.6	2.7
Median No. Hrs	2.0	2.5	3.0	2.0

Table 30. Hours Reasonable to Reach Destination

	Cat 1 Surge Zone N=140	Other Surge Zones N=81	Coastal County Non-surge N=24	Non-coastal Counties N=24
Less than 2	44	29	30	55
2 to 5	27	42	35	20
5 to 10	28	26	30	25
10 or more	1	3	5	0

Mean No. Hrs	3.2	3.3	4.0	3.0
Median No. Hrs	2.0	3.0	4.0	1.25

Most people thought the traffic delays were caused mainly by the sheer volume of traffic and the fact that too many people left at once (Table 31). Many also cited poor traffic management and advocated reversing lane directions. Most respondents said they would be willing to cooperate in a phased evacuation in which they would delay their departure for a few hours until people in a more dangerous location had begun their evacuation (Table 32).

Table 31. Why Traffic Was Slow

	Cat 1 Surge Zone N=163	Other Surge Zones N=83	Coastal County Non-surge N=24	Non-coastal Counties N=27

Number of Cars	40	54	42	67
All Left at Once	40	57	33	37
Waited too Long	9	13	13	19
Construction	1	4	4	4
Accidents	1	1	4	4
Poor Traffic Management	27	35	13	19
Need Reverse Lanes	17	13	25	19
Bad Weather	2	2		7
Other	18	11	17	33
Don't Know	20	6	8	4

Table 32. Would Delay Departure if Urged by Officials

	Cat 1 Surge Zone N=204	Other Surge Zones N=201	Coastal County Non-surge N=011	Non-coastal Counties N=105
Yes	78	74	75	83

Depends on Storm's Proximity	5	7	2	6
Depends on Storm's Strength	1	4	1	
Other	2	1	2	1
Don't Know	6	8	5	7
No	8	8	14	4

Most evacuees did not cite specific difficulties experienced during the evacuation. Needing restroom facilities was most common, but a few ran out of gas or had mechanical breakdowns (Table 33). More than 35% of the evacuees said they heard about places where they could find shelter if they weren't able to reach their destinations (Table 34). Few changed their plans about seeking shelter as a result (Table 35). Most interviewees reported no difficulties returning from the evacuation (Table 36).

Table 33. Difficulties Experienced in Evacuation

	Cat 1 Surge Zone N=164	Other Surge Zones N=85	Coastal County Non-surge N=24	Non-coastal Counties N=26
Ran Out of Gas	2	1		
Car Broke Down	3	2		
Needed Water	1	2		4
Needed Food	4	4		4
Needed Restroom	7	11		4

Other Difficulties	1			
No Difficulties	87	85	100	96

Table 34. Heard About Refuge Options After Leaving Home

	Cat 1 Surge Zone N=162	Other Surge Zones N=85	Coastal County Non-surge N=24	Non-coastal Counties N=26
Yes	39	35	33	62
No	59	64	63	39
Don't Know	2	1	4	

Table 35. Changed Plans Because of Refuge Information Heard After Leaving Home

	Cat 1 Surge Zone N=62	Other Surge Zones N=29	Coastal County Non-surge N=7	Non-coastal Counties N=16
Yes	13	3	0	6
No	87	97	100	94
Don't Know				

Table 36. Difficulties Experienced Returning from Evacuation

	Cat 1 Surge Zone N=164	Other Surge Zones N=85	Coastal County Non-surge N=24	Non-coastal Counties N=27
Lack of Information	2			
Roads Blocked	1	2		
Traffic Congested	7	2	4	11
Re-entry Not Permitted	2	2		
Other Difficulties	2	1		11
No Difficulties	87	92	96	85

Vehicle use was typical of most evacuations, in which 65% to 75% of the available vehicles are used (Table 37). Few households required assistance in evacuating, and in most instances outside agencies were not required (Table 38).

Table 37. Vehicle Use by Evacuating Households

	Cat 1 Surge Zone N=164	Other Surge Zones N=85	Coastal County Non-surge N=24	Non-coastal Counties N=25
Percent of Available	74	66	68	70

Avg. Number Per Household	1.45	1.39	1.17	1.52
Pulled Trailer, Took Motorhome	5	3	4	0

Table 38. Required Assistance in Evacuating

	Cat 1 Surge Zone N=163	Other Surge Zones N=85	Coastal County Non-surge N=24	Non-coastal Counties N=27
Yes, Within Household	2	6		
Yes, Friend/ Relative	1	1	4	
Yes, Agency	1	1		
No	96	92	96	100

Local television was relied upon most heavily by the respondents for information about Floyd, followed by The Weather Channel (Table 39). Local radio was the third most relied-upon source of information.

Table 39. Relied On a Great Deal for Information about Floyd

	Cat 1 Surge Zone N=201	Other Surge Zones N=200	Coastal County Non-surge N=100	Non-coastal Counties N=105
Local Radio	30	28	27	24
Local Television	78	73	91	82
CNN	13	21	12	11
Weather Channel	54	53	52	44
Other Cable	5	6	7	8
Internet	5	6	4	4
AOL	3	4	2	1
Word of Mouth	10	12	11	8

Most respondents in the sample said they wouldn't do anything differently if faced with the same circumstances again as in Floyd (Table 40). Some who left wouldn't, but some who didn't leave would. Many would plan to leave earlier.

Table 40. Would Do Differently Next Time

	Cat 1 Surge Zone N=204	Other Surge Zones N=201	Coastal County Non-surge N=100	Non-coastal Counties N=105
Would Leave	8	4	7	4
Wouldn't Leave	13	11	9	4
Leave Earlier	23	16	13	12
Leave Later	3	1		
Go Farther	2	1	1	
Go Closer	3	1	1	
Use Public Shelter	1	1		
Not Use Pub Shltr				1
Different Route	6	2		
Buy Gasoline		1		
Take Provisions	2	2		2
Other	9	9	8	4
Don't Know	3	6	4	4
Nothing Different	52	65	67	77

Chapter 6

Public Response to Hurricane Floyd

In the Savannah, Georgia Region

Prepared by

Earl J. Baker

Hazards Management Group, Inc.

Survey Method

Approximately 600 telephone interviews were conducted in the northern tier of Georgia coastal and adjacent counties. The sample was stratified as follows:

1. 200 interviews in areas at risk to storm surge in category 1 hurricanes
2. 200 interviews in areas at risk to storm surge in stronger hurricanes
3. 100 interviews in areas of coastal counties not subject to inundation by storm surge
4. 100 interviews in adjacent non-coastal counties.

Inundation zones on maps prepared for the most recent hurricane evacuation study for the region were used to identify the sampling areas. A copy of the generic questionnaire used in the post-Floyd surveys is included as Appendix I.

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Therefore, readers should keep in mind that some estimates provided in this report are more statistically reliable than others. This is particularly noteworthy in drawing conclusions about whether two survey results are "different" from one another. Differences of a few percentage points in sample results of 100 or less do not necessarily mean the populations from which the samples were drawn are different. When the aggregate samples are broken down into subgroups, the reliability of estimates for the subgroups suffers. Tables contain actual sample sizes used to calculate the values reported in the table. Sample sizes vary from table to table because not all questions were asked of all respondents (people who didn't evacuate weren't asked where they went, for example), some respondents refused to answer some questions, and in a few cases responses were invalid.

Evacuation Participation Rates

Evacuation, as used in the survey, refers to leaving one's home to go someplace safer. In the category 1 risk zone, 90% evacuated, almost equaled by those in other surge zones (Table 1). These are unusually high participation rates, especially outside the category 1 zone. There was a pronounced "shadow" evacuation in adjacent noncoastal counties (i.e., evacuation from areas not told by officials to evacuate).

Table 1. Percent who left their homes in Floyd, by risk zone

	Cat 1 Surge Zone N=212	Other Surge Zones N=205	Coastal Non-surge N=107	Non-coastal Counties N=100
Evacuated	90	86	61	33

Most of the residents who did not evacuate gave the same reason: they felt their home would be safe, given the likely track and strength of the storm (Table 2). Some apparently observed the heavy traffic and decided not to leave. Some said they attempted to evacuate but gave up because of the traffic.

Table 2. Why Stayed (Percent of Respondents)

	Cat 1 Surge Zone N=20	Other Surge Zones N=19	Coastal County Non-Surge N=41	Non-coastal Counties N=64
House OK for Storm	30	26	37	61
Officials Said Stay	5		5	17
Media Said Stay				8
Friends Said Stay	10	5		5
Officials Didn't Say Leave	5		2	6
Probabilities Low	10	5	7	16
Other Info. Would Miss	10	11	7	11
No Transport		11	2	

Table 2. Why Stayed (Percent of Respondents) continued

No Place to Go		5		3
Protect from Looters	5	5	2	

Protect from Storm		11		2
Left in Past Miss	15			
Job	30	5	27	8
Waited Too Long	5		2	
Traffic	5	16	10	3
Tried, Gave Up			10	2
Dangerous on Road		11		3
Pets	5	5	27	2
Required Medical Care				
Other	15	21	17	6
Don't Know		11	5	2

Jobs were mentioned by some as a reason for not leaving, and respondents were asked specifically whether anyone in their household had to work during Floyd and how that affected their evacuation (Tables 3, 4). At least a fourth (and more than half in one area) said someone in the household had to work, and some said it either prevented some in the household from evacuating or delayed their departure.

Table 3. Someone in Household Had to Work in Floyd

	Cat 1 Surge Zone N=211	Other Surge Zones N=205	Coastal County Non-surge N=107	Non-coastal Counties N=100
Yes	24	24	59	45
No	76	75	42	55
Don't Know		1		

Table 4. How Work Affected Evacuation in Floyd

	Cat 1 Surge Zone N=51	Other Surge Zones N=44	Coastal County Non-surge N=61	Non-coastal Counties N=45
None	57	36	46	82
Kept All from Leaving	4	5	16	4
Kept Part from Leaving		9	3	4
Delayed All in Leaving	28	43	28	7
Delayed Part in Leaving	8	2	3	2
Other	4	5	2	

Those who didn't evacuate were asked whether they would have left had they been convinced the storm was going to strike, and most said they would have (Table 5). Most also said they had made the necessary preparations to leave in case conditions worsened (Table 6).

Table 5. Stayers Who Say They Would Have Left If Convinced Storm Was Going to Hit

	Cat 1 Surge Zone N=22	Other Surge Zones N=19	Coastal County Non-surge N=42	Non-coastal Counties N=67
Would Have Left	64	37	67	69
Wouldn't Have Left	32	58	17	25
Don't Know	5	5	2	6
Other				

Table 6. Stayers Who Say They Had Made Necessary Preparations to Leave

	Cat 1 Surge Zone N=22	Other Surge Zones N=19	Coastal County Non-surge N=42	Non-coastal Counties N=67
Had Prepared	77	63	74	72
Hadn't Prepared	23	37	21	25
Don't Know			5	2

Evacuees were asked what convinced them to leave, and most indicated some combination of response to actions by public officials (including the NWS) and concern about storm conditions (Table 7.) Friends and the media played slightly lesser roles.

Table 7. Why Evacuees Left (Percent of Respondents)

	Cat 1 Surge Zone N=185	Other Surge Zones N=173	Coastal County Non-surge N=64	Non-coastal Counties N=33
Officials Said Leave	44	33	30	21
NWS Said Leave	28	17	11	3
Police/Fire Said Leave	4	6	14	6
Media Said Leave	26	32	25	18
Friend Said Leave	14	20	13	27
Storm Severe	31	25	27	55
Heard “Bad as Hugo/ Andrew”	3	6	3	9
Increased in Strength	4	1		
Concerned about Flooding	9	6	3	12
Concerned about Winds	8	7	13	27
Concerned re. Road Flooding	4	2	2	

Probability of Hit	16	12	17	15
Post-Storm Concerns	2	1	2	3
Other	15	13	8	15
Don't Know	2	2	2	

In an attempt to separate the effect of messages disseminated by government officials via the media from the effect of other information heard via the media, respondents were asked which had the greater impact on their decision to evacuate. Information from officials had the greater impact, according to respondents (Table 8).

Table 8. Greatest Influence to Leave (Percent of Respondents)

	Cat 1 Surge Zone N=185	Other Surge Zones N=173	Coastal County Non-surge N=64	Non-coastal Counties N=33
Media Info from Gov't Officials	54	56	55	49
Other Media Info	32	25	38	21

Info from Friends	18	25	19	27
Other	15	8	2	9
Don't Know	1	1		

Interviewees were also asked whether they heard from officials – either directly or indirectly – that they should evacuate. A majority in the coastal counties, even in non-surge areas, said they did (Table 9). In the surge zones people who didn't hear the evacuation notices were as likely to evacuate as those who did (Table 10). In non-surge areas those who heard (or thought they heard) evacuation notices were significantly more likely than others to leave.

Table 9. Heard Evacuation Notices from Officials

	Cat 1 Surge Zone N=211	Other Surge Zones N=206	Coastal County Non-Surge N=107	Non-coastal Counties N=104
Heard Notice	77	77	69	30
Didn't Hear	20	23	30	74
Don't Know	2	1	1	0

Table 10. Evacuation Participation Rates, by Hearing Evacuation Notices from Officials (Sample size varies by cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Heard Must	91	87	68	73
Heard Should	81	83	73	64

Didn't Hear	91	83	47	18

Few people, even those living outside the surge zones, believe they would be safe in a 125 MPH hurricane in their own homes (Table 11a). In all four risk zones people who perceived their homes to be vulnerable were more likely than others to evacuate (Table 11b).

Table 11a. Perceived Safety of Home from Wind and Water in 125 MPH Hurricane

	Cat 1 Surge Zone N=212	Other Surge Zones N=206	Coastal County Non-Surge N=107	Non-coastal Counties N=104
Safe	9	19	23	35
Unsafe	81	71	66	55
Don't Know	10	10	10	10

Table 11b. Evacuation Participation Rates, by Perceived Safety in 125 MHP Storm (See previous table for sample sizes for each cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Safe	65	62	48	11
Unsafe	93	91	69	49
Don't Know	86	95	36	20

Evacuation Timing

Evacuation departures were fairly gradual, primarily during September 14 and 15, with the steepest portion of the response on the 14th. By the end of the day on the 14th, nearly 80% of the evacuees had left. A hurricane watch was issued for the area at 5 PM on the 13th, followed by a warning at 5 PM on the 14th.

Use of Public Shelters and Other Refuges

The great majority of evacuees went to the homes of friends and relatives or to hotels and motels (Table 12). Only in the coastal non-surge zone did more than five percent of those interviewed say they went to public shelters.

Table 12. Types of refuge used (percent of evacuees)

	Cat 1 Surge Zone N=189	Other Surge Zones N=177	Coastal County Non-Surge N=61	Non-coastal Counties N=33
Public Shelter	2	3	7	
Church	1	7	7	6
Friend/Relative	65	61	62	67
Hotel/Motel	27	21	15	15
Workplace			3	3
Other	5	9	7	9

Evacuation Destinations and Transportation Issues

Almost all evacuees left their own county, going elsewhere in Georgia (Tables 13, 14). These are much higher out-of-county destinations than normally observed. However, at least some of the coastal counties (e. g., Chatham) issued evacuation notices for the entire county, and no public shelters are provided in coastal counties.

Table 13. Percent of evacuees by destination, by risk zone

	Cat 1 Surge Zone N=191	Other Surge Zones N=173	Coast Non-Surge N=61	Non-Coastal Counties N=33
Own Neighborhood	<1	<1	3	9

Own County	6	2	2	3
Out of County	94	97	95	88

Table 14. Percent of out-of-county evacuees, by state destination

Florida	1
Georgia	84
South Carolina	4
North Carolina	4
Virginia	<1
Alabama	3
Tennessee	1
Other	<1

Going out of county was prompted by three main factors: the strength of the storm, the location of friends and family, and the lack of closer motels (Table 15). As noted above, entire counties were told to evacuate by officials. Information from government officials conveyed by the media was a larger influence than other media information (Table 16).

Table 15. Reasons for Going Out of County

	Cat 1 Surge Zone N=172	Other Surge Zone N=150	Coastal County Non-surge N=58	Non-coastal Counties N=29
Strength of Storm	16	15	21	17
Previous Hurri-cane Experience	6	5	2	3
Comparisons to Hugo/Andrew	3		2	10
Officials Said Leave County	5	5	5	
Media Said Leave County	6	5	5	3
Friend Said Leave County	8	11	5	7
Friend Lives in Destination	54	53	57	69
No Public Shelter Closer	3	9	12	
No Motels Closer	22	23	28	10
Other	16	13	5	3

Don't Know		1		

Table 16. Greatest Influence for Going Out of County

	Cat 1 Surge Zone N=170	Other Surge Zones N=148	Coastal County Non-surge N=57	Non-coastal Counties N=29
Media Info from Gov't Officials	51	44	47	38
Other Media Info	23	15	25	28
Info from Friends	21	32	21	31
Other	19	18	11	10
Don't Know	1			

Approximately 75% of the evacuees from most risk areas eventually reached their destinations (Table 17). Of those who changed destinations, most went someplace farther than anticipated (Table 18). Traffic, location of refuge, and fatigue were the main reasons for changing destinations (Table 19).

Table 17. Whether Reached Original Destination

	Cat 1 Surge Zone N=189	Other Surge Zones N=173	Coastal County Non-surge N=64	Non-coastal Counties N=33
Yes	83	78	72	91
No	15	19	27	9
Don't Know	2	3	2	

Table 18. Proximity of New Destination, Compared to Original Destination

	Cat 1 Surge Zone N=28	Other Surge Zones N=30	Coastal County Non-surge N=17	Non-coastal Counties N=3
Farther	57	63	65	67
Closer	32	27	35	33
Same	11	7		
Don't Know		3		

Table 19. Why Changed Destination

	Cat 1 Surge Zone N=27	Other Surge Zones N=29	Coastal County Non-surge N=17	Non-coastal Counties N=3

Traffic	26	35	24	
Loc. of Refuge	41	45	41	33
Out of Gas				
Tired	7	28	24	
Hungry		3		
Bathroom				
Storm Strengthened		3	6	33
Storm Close			6	
Other	44	35	18	33
Don't Know	7	2		

Most people from surge zones said they did not hear about traffic problems on evacuation routes before leaving home, although those from non-surge areas did (Table 20). Of those who heard about such problems before leaving, most did not change their evacuation route plans (Table 21).

Table 20. Heard About Evacuation Route Problems Before Leaving Home

	Cat 1 Surge Zone N=190	Other Surge Zones N=173	Coastal County Non-surge N=64	Non-coastal Counties N=33
Yes	35	40	69	70

No	62	57	31	27
Don't Know	3	3		3

Table 21. Changed Routes Because of Information Heard Before Leaving Home

	Cat 1 Surge Zone N=67	Other Surge Zones N=65	Coastal County Non-surge N=44	Non-coastal Counties N=22
Yes	25	39	50	55
No	73	62	50	45
Don't Know	2			

Those who said they had heard about evacuation problems before leaving home were also asked whether they heard about such problems after leaving home. About two-thirds said they did (Table 22). Some, but not most, changed their route plans accordingly (Table 23).

Table 22. Heard About Evacuation Route Problems After Leaving Home

	Cat 1 Surge Zone N=67	Other Surge Zone N=63	Coastal County Non-surge N=44	Non-coastal Counties N=23
Yes	64	75	73	50
No	31	25	27	50

Don't Know	5			

Table 23. Changed Routes Because of Information Heard After Leaving Home

	Cat 1 Surge Zone N=42	Other Surge Zones N=47	Coastal County Non-surge N=32	Non-coastal Counties N=12
Yes	17	25	38	42
No	81	75	63	58
Don't Know	2			

Most evacuees from surge areas used interstate highways for at least part of their evacuation (Table 24). Those from non-surge areas did not. Those who used interstates in Floyd gave a mixture of future intentions concerning road use, but the overall tendency appeared to be flexibility, depending upon the circumstances (Table 25). Approximately 75% of the respondents said they were familiar with the roads in the area through which they evacuated (Table 26). Three-fourths also said they would be willing to use a different route than they would normally use if government officials urged them to do so to avoid congestion, even if the route took them out of their way (Table 27). Less than 10% said they would be unwilling to comply with that sort of request by officials.

Table 24. Used Interstate for at Least Part of Route

	Cat 1 Surge Zone N=190	Other Surge Zones N=170	Coastal County Non-surge N=64	Non-coastal Counties N=33

Yes	70	66	39	39
No	30	34	58	61
Don't Know	1		3	

Table 25. Routes to be Used in the Future

	Cat 1 Surge Zone N=133	Other Surge Zones N=104	Coastal County Non-surge N=25	Non-coastal Counties N=13
Interstate	50	37	40	46
Secondary Roads	16	35	52	15
Both	16	14	4	15
Depends on Traffic	6	3		8
Depends on Other	8	7		
Other		2	4	8
Don't Know	5	4		8

Table 26. Familiar with Roads in Area

	Cat 1 Surge Zone N=190	Other Surge Zones N=170	Coastal County Non-surge N=64	Non-coastal Counties N=85

Yes	74	73	78	85
No	23	24	22	15
Don't Know	3	3		

Table 27. Would Use Routes Advised by Officials, Even if Longer

	Cat 1 Surge Zone N=190	Other Surge Zones N=173	Coastal County Non-surge N=64	Non-coastal Counties N=33
Yes	74	74	75	85
No	5	9	8	3
Depends How Much Longer	7	2	6	
Depends on Other	12	12	8	12
Other	1			
Don't Know	3	3	3	

More than half the respondents said it took them more than five hours to reach their destination, and about a third said it took 15 or more hours (Table 28). The exception was non-coastal counties which had much lower evacuation times. Anticipated evacuation travel times were much lower than actual (Table 29). When asked how long it was reasonable for an evacuation like Floyd's to take, most respondents gave times shorter than the actual evacuation but slightly longer than their original expectation (Table 30).

Table 28. Hours Required to Reach Destination

	Cat 1 Surge Zone N=184	Other Surge Zones N=170	Coastal County Non-surge N=63	Non-coastal Counties N=33
Less than 2	25	16	5	16
2 to 5	19	17	22	53
5 to 10	28	33	41	47
10 to 15	22	24	26	0
15 or more	6	10	6	0
Mean No. Hrs	6.7	7.7	7.9	4.2
Median No. Hrs	5.5	7.0	7.0	4.0

Table 29. Hours Expected to Reach Destination

	Cat 1 Surge Zone N=174	Other Surge Zones N=168	Coastal County Non-surge N=63	Non-coastal Counties N=30

Less than 2	29	18	7	20
2 to 5	41	48	56	63
5 to 10	27	31	36	17
10 to 15	3	3	0	0
15 or more	0	0	0	0
Mean No. Hrs	3.5	4.0	4.2	3.2
Median No. Hrs	3.5	4.0	4.0	3.0

Table 30. Hours Reasonable to Reach Destination

	Cat 1 Surge Zone N=165	Other Surge Zones N=160	Coastal County Non-surge N=59	Non-coastal Counties N=29
Less than 2	27	18	6	17
2 to 5	30	32	46	52
5 to 10	39	42	42	31
10 to 15	4	8	6	0
15 or more	0	0	0	0
Mean No. Hrs	4.1	4.7	4.9	3.4
Median No. Hrs	4.0	5.0	4.5	4.0

Most people thought the traffic delays were caused mainly by the sheer volume of traffic and the fact that too many people left at once (Table 31). Many also cited poor traffic management and advocated reversing lane

directions. The great majority of respondents said they would be willing to cooperate in a phased evacuation in which they would delay their departure for a few hours until people in a more dangerous location had begun their evacuation (Table 32).

Table 31. Why Traffic Was Slow

	Cat 1 Surge Zone N=188	Other Surge Zones N=173	Coastal County Non-surge N=64	Non-coastal Counties N=33
Number of Cars	58	58	44	55
All Left at Once	42	50	43	58
Waited too Long	13	18	13	9
Construction	1			
Accidents	5	4	2	3
Poor Traffic Management	27	32	29	9

Need Reverse Lanes	13	11	11	9
Bad Weather	3	1		3
Other	14	9	22	18
Don't Know	13	8	8	18

Table 32. Would Delay Departure if Urged by Officials

	Cat 1 Surge Zone N=210	Other Surge Zones N=206	Coastal County Non-surge N=107	Non-coastal Counties N=100
Yes	84	81	88	89
Depends on Storm's Proximity	3	3	1	3
Depends on Storm's Strength	2	2	3	4
Other	2	2		1
Don't Know	4	6	6	
No	4	7	4	3

Most evacuees did not cite specific difficulties experienced during the evacuation. Needing restroom facilities was most common, but a few ran out of gas or had mechanical breakdowns (Table 33). Almost half the evacuees said they heard about places where they could find shelter if they weren't able to reach their destinations (Table 34). Few changed their plans about seeking shelter as a result (Table 35). Most interviewees reported no difficulties returning from the evacuation (Table 36).

Table 33. Difficulties Experienced in Evacuation

	Cat 1 Surge Zone N=189	Other Surge Zones N=173	Coastal County Non-surge N=64	Non-coastal Counties N=33
Ran Out of Gas	1	1	2	
Car Broke Down	3	3	3	3
Needed Water	3	3	2	
Needed Food	5	4	3	
Needed Restroom	15	11	13	
Other Difficulties	3	3	2	3
No Difficulties	79	85	83	94

Table 34. Heard About Refuge Options After Leaving Home

	Cat 1 Surge Zone N=190	Other Surge Zones N=171	Coastal County Non-surge N=64	Non-coastal Counties N=33

Yes	42	48	56	46
No	54	48	44	39
Don't Know	4	5		6

Table 35. Changed Plans Because of Refuge Information Heard After Leaving Home

	Cat 1 Surge Zone N=133	Other Surge Zones N=76	Coastal County Non-surge N=35	Non-coastal Counties N=15
Yes	5	7	6	
No	95	93	94	100
Don't Know				

Table 36. Difficulties Experienced Returning from Evacuation

	Cat 1 Surge Zone N=189	Other Surge Zones N=173	Coastal County Non-surge N=64	Non-coastal Counties N=33
Lack of Information	1	1		
Roads Blocked	1			
Traffic Congested	6	6	8	3

Re-entry Not Permitted		1		
Other Difficulties	2	1	2	
No Difficulties	92	92	91	97

Vehicle use was typical of most evacuations, in which 65% to 75% of the available vehicles are used (Table 37). It was slightly high in the surge zones beyond the category 1 area and slightly low in non-coastal counties. Few households required assistance in evacuating, and in most instances outside agencies were not required (Table 38).

Table 37. Vehicle Use by Evacuating Households

	Cat 1 Surge Zone N=188	Other Surge Zones N=176	Coastal County Non-surge N=64	Non-coastal Counties N=32
Percent of Available	67	78	66	57
Avg. Number Per Household	1.42	1.54	1.48	1.47
Pulled Trailer, Took Motorhome	3	8	2	3

Table 38. Required Assistance in Evacuating

	Cat 1 Surge Zone N=189	Other Surge Zones N=177	Coastal County Non-surge N=64	Non-coastal Counties N=34
Yes, Within Household	4	4	2	3
Yes, Friend/ Relative	2	1		3
Yes, Agency				
No	94	95	98	95

Local television was relied upon most heavily by the respondents for information about Floyd, followed by The Weather Channel (Table 39). Local radio was the third most relied-upon source of information.

Table 39. Relied On a Great Deal for Information about Floyd

	Cat 1 Surge Zone N=209	Other Surge Zones N=200	Coastal County Non-surge N=106	Non-coastal Counties N=102
Local Radio	35	40	24	35
Local Television	70	79	81	70
CNN	14	17	22	23
Weather Channel	66	65	59	55
Other Cable	7	3	3	7
Internet	8	4	4	5
AOL	4	1	3	1
Word of Mouth	10	17	23	11

Most respondents in the sample said they wouldn't do anything differently if faced with the same circumstances again as in Floyd (Table 40). Some who left wouldn't, but some who didn't leave would. Many would plan to leave earlier.

Table 40. Would Do Differently Next Time

	Cat 1 Surge Zone N=210	Other Surge Zones N=200	Coastal County Non-surge N=107	Non-coastal Counties N=102
Would Leave	3	7	10	5
Wouldn't Leave	9	12	15	2
Leave Earlier	40	37	31	12

Leave Later	7	4	1	4
Go Farther	1	1	1	1
Go Closer	3	2	1	1
Use Public Shelter		1		
Not Use Pub Shltr	1	1	1	
Different Route	10	6	6	
Buy Gasoline	1		1	
Take Provisions	3	3	4	3
Other	14	9	8	6
Don’t Know	7	4	4	5
Nothing Different	40	37	38	68

Chapter 10

Public Response to Hurricane Floyd

In Southeastern North Carolina

Prepared by

Earl J. Baker

Hazards Management Group, Inc.

Survey Method

Approximately 600 telephone interviews were conducted in southeastern North Carolina, in the Wilmington region. This included the coastal counties of Brunswick, New Hanover, Pender, and Onslow. The sample was stratified as follows:

1. 200 interviews in areas at risk to storm surge in category 1 hurricanes
2. 200 interviews in areas at risk to storm surge in stronger hurricanes
3. 100 interviews in areas of coastal counties not subject to inundation by storm surge
4. 100 interviews in non-coastal counties adjacent to the coastal counties.

Evacuation zones defined in the most recent hurricane evacuation study for the region were used to identify the sampling areas. A copy of the generic questionnaire used in post-Floyd surveys is included as Appendix I.

Statistical Reliability

Figures reported from surveys cited in this report are based upon samples taken from larger populations. The sample values provide estimates of the values of the larger populations from which the samples were selected, but usually are not precisely the same as the true population values. In general, the larger the number of people in the sample, the closer the sample value will be to the true population value. A sample of 200 will provide estimates which one can be 90% “confident” are within 4 to 6 percentage points of the true populations values, whereas a sample of 100 will provide the same degree of confidence of being within 5 to 8 percentage points of the true population values. With a sample of 50, one can be 90% "confident" of being within 7 to 11 percentage points of the actual population value, and a sample of 25 is 90% "accurate" only within 10 to 17 percentage points. With a sample of 50, one can be 90% "confident" of being within 7 to 12 percentage points of the actual population value. A sample of 25 is 90% "accurate" only within 10 to 17 percentage points.

The ranges (e.g., "10 to 17") stem from the fact that the reliability of an estimate depends not only on the size of the sample but also upon how much agreement there is among the responses. Having 90% of the respondents give a particular answer means almost everyone agreed. By the same reasoning, if only 10%

gave a particular response, almost everyone agreed (i.e., 90% disagreed with the 10% but agreed with one another). The maximum disagreement is for the responses to be split 50-50. Thus, if 90% (or 10%) of a sample of 100 give a particular response, that estimate will be within 5 percentage points of the true population value 90% of the time. If 75% (or 25%) of a sample of 100 give a particular response, that estimate will be within 7 percentage points 90% of the time. If 50% of a sample of 100 give a particular response, that estimate will be within 8 percentage points 90% of the time.

Therefore, readers should keep in mind that some estimates provided in this report are more statistically reliable than others. This is particularly noteworthy in drawing conclusions about whether two survey results are "different" from one another. Differences of a few percentage points in sample results of 100 or less do not necessarily mean the populations from which the samples were drawn are different. When the aggregate samples are broken down into subgroups, the reliability of estimates for the subgroups suffers. Tables contain actual sample sizes used to calculate the values reported in the table. Sample sizes vary from table to table because not all questions were asked of all respondents (people who didn't evacuate weren't asked where they went, for example), some respondents refused to answer some questions, and in a few cases responses were invalid. There are so few respondents in certain risk zones for some questions that the results are not useful for generalizations. They are included solely for completeness.

In nearly all tables data refer to percentages of respondents. In response to some questions respondents could give more than one answer, resulting in totals exceeding 100%.

Evacuation Participation Rates

Evacuation, as used in the survey, refers to leaving one's home to go someplace safer. In the category 1 risk zone, more than half evacuated, as did slightly less than half in other surge zones (Table 1). The "shadow" evacuation in other risk areas (i.e., evacuation from areas not told by officials to evacuate) was substantial, contributing to the evacuating traffic.

Table 1. Percent who left their homes in Floyd, by risk zone

	Cat 1 Surge Zone N=196	Other Surge Zones N=199	Coastal Non-surge N=103	Non-coastal Counties N=102
Evacuated	57	44	30	28

Most of the residents who did not evacuate gave the same reason: they felt their home would be safe enough, given their beliefs about the likely track and strength of the storm (Table 2). No other single reason was prominent in the responses.

Table 2. Why Stayed (Percent of Respondents)

	Cat 1 Surge Zone N=80	Other Surge Zones N=102	Coastal County Non-Surge N=70	Non-coastal Counties N=68
House OK for Storm	65	61	81	82
Officials Said Stay		8	1	2
Media Said Stay	1	1	1	3
Friends Said Stay	8	3	1	4
Officials Didn't Say Leave	8	5	7	9
Probabilities Low	4	9	9	6
Other Info. Would Miss	3	6	6	2
No Transport			1	
No Place to Go	4	5	6	3

Table 2. Why Stayed (Percent of Respondents) continued

Protect from Looters	1			
Protect from Storm	11	2	1	
Left in Past Miss	14	6	9	4
Job	9	8	3	3
Waited Too Long	3		1	
Traffic	10	7	6	
Tried, Gave Up				
Dangerous on Road	4	1		
Pets	9	1		7
Required Medical Care		1		2
Other	15	19	14	15
Don’t Know	3	7		

Jobs were mentioned by some, and respondents were asked specifically whether anyone in their household had to work during Floyd and how that affected their evacuation (Tables 3, 4). At least a fourth said someone in the household had to work, and some (but not most) said it either prevented part of the household from evacuating or delayed their departure.

Table 3. Someone in Household Had to Work in Floyd

	Cat 1 Surge Zone N=196	Other Surge Zones N=199	Coastal County Non-surge N=103	Non-coastal Counties N=103
Yes	29	25	34	28
No	71	75	66	72

Table 4. How Work Affected Evacuation in Floyd

	Cat 1 Surge Zone N=56	Other Surge Zones N=48	Coastal County Non-surge N=35	Non-coastal Counties N=29
None	64	81	74	83
Kept All from Leaving	5	6	11	7
Kept Part from Leaving	2		3	
Delayed All in Leaving	21	13	6	3
Delayed Part in Leaving	2		3	
Other	5		3	7

Those who didn't evacuate were asked whether they would have left had they been convinced the storm was going to strike, and almost half said they would have (Table 5). Most in surge zones also said they had made the necessary preparations to leave in case conditions worsened (Table 6).

Table 5. Stayers Who Say They Would Have Left If Convinced Storm Was Going to Hit

	Cat 1 Surge Zone N=83	Other Surge Zones N=109	Coastal County Non-surge N=72	Non-coastal Counties N=72

Would Have Left	39	44	46	42
Wouldn't Have Left	46	44	44	44
Don't Know	15	12	10	14

Table 6. Stayers Who Say They Had Made Necessary Preparations to Leave

	Cat 1 Surge Zone N=83	Other Surge Zones N=109	Coastal County Non-surge N=72	Non-coastal Counties N=72
Had Prepared	76	78	51	40
Hadn't Prepared	23	21	49	57
Don't Know	1	1		3

Evacuees were asked what convinced them to leave, and most indicated some combination of response to actions by public officials and concern about storm conditions (Table 7.)

Table 7. Why Left (Percent of Respondents)

	Cat 1 Surge Zone N=109	Other Surge Zones N=82	Coastal County Non-surge N=30	Non-coastal Counties N=29

Officials Said Leave	22	10	7	3
NWS Said Leave	18	21	7	3
Police/Fire Said Leave	4	4	3	
Media Said Leave	13	17	7	
Friend Said Leave	10	17	6	24
Storm Severe	46	44	31	24
Heard “Bad as Hugo/ Andrew”	11	2	8	3
Increased in Strength	5	9	7	3
Concerned about Flooding	12	9	3	14
Concerned about Winds	12	18	40	28
Concerned re. Road Flooding	4	4		7
Probability of Hit	7	17	10	3

Post-Storm Concerns	3	2		
Other	17	10	10	41
Don't Know	1	1		

In an attempt to separate the effect of messages disseminated by government officials via the media from the effect of other information heard via the media, respondents were asked which had the greater impact on their decision to evacuate. Information from officials had the greater impact in the category 1 surge zone, but not in other areas, according to respondents (Table 8).

Table 8. Greatest Influence to Leave (Percent of Respondents)

	Cat 1 Surge Zone N=109	Other Surge Zones N=87	Coastal County Non-surge N=31	Non-coastal Counties N=30
Media Info from Gov't Officials	55	40	31	17
Other Media Info	30	41	45	23

Info from Friends	19	16	19	37
Other	6	8	3	30
Don't Know	1	3	3	

Interviewees were also asked whether they heard from officials – either directly or indirectly – that they should evacuate. Only in the category 1 risk area did a majority say they did, and even there almost as many did not (Table 9). Those who did hear evacuation notices were more likely than others to evacuate, particularly if they believed the notice to be mandatory (Table 10).

Table 9. Heard Evacuation Notices from Officials

	Cat 1 Surge Zone N=196	Other Surge Zones N=198	Coastal County Non-Surge N=102	Non-coastal Counties N=102
Heard Notices	51	32	26	11
Didn't Hear	47	65	74	89
Don't Know	3	3	1	0

Table 10. Evacuation Participation Rates, by Hearing Evacuation Notices from Officials (Sample sizes vary by cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Heard Must	84	85	67	100
Heard Should	63	63	50	83

Didn't Hear	37	30	21	22

Many people living in all four risk areas believe they would be safe in a 125 MPH hurricane in their own homes (Table 11a). Only in the category 1 surge zone did a majority say their homes would be unsafe, and then by a small margin. In all four risk zones people who perceived their homes to be vulnerable were more likely than others to evacuate (Table 11b).

Table 11a. Perceived Safety of Home from Wind and Water in 125 MPH Hurricane

	Cat 1 Surge Zone N=196	Other Surge Zones N=199	Coastal County Non-Surge N=103	Non-coastal Counties N=102
Safe	41	57	62	41
Unsafe	51	32	28	44
Don't Know	9	10	10	15

Table 11b. Evacuation Participation Rates, by Perceived Safety in 125 MHP Storm (See previous table for sample sizes for each cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Safe	41	39	19	19
Unsafe	72	47	52	47
Don't Know	47	65	40	0

Evacuation Timing

Evacuation departures were fairly gradual, primarily during September 14 and 15, with the steepest portion of the response on the 15th. Thirty percent of the eventual evacuees had left by 8 AM on the 15th. A hurricane watch was issued for the area at 5 PM on the 14th, followed by a warning at 11 AM on the 15th.

Use of Public Shelters and Other Refuges

The great majority of evacuees went to the homes of friends and relatives or to hotels and motels (Table 12). Only one to two percent of those interviewed said they went to public shelters.

Table 12. Refuges Uses by Evacuees

	Cat 1 Surge Zone N=105	Other Surge Zones N=83	Coastal County Non-Surge N=30	Non-coastal Counties N=28
Public Shelter	1	2		
Church		4	3	
Friend/Relative	73	64	77	79
Hotel/Motel	19	22	7	11
Workplace	4		10	
Other	3	8	3	11

Evacuation Destinations and Transportation Issues

Most evacuees left their own county, going elsewhere in North Carolina (Tables 13, 14). Fifteen percent went into Virginia or northward, and 9% went into South Carolina.

Table 13. Percent of evacuees by destination, by risk zone

	Cat 1 Surge Zone N=105	Other Surge Zones N=83	Coast Non-Surge N=30	Non-Coastal Counties N=28

Own Neighborhood	15	17	30	25
Own County	24	13	10	50
Out of County	61	70	60	25

Table 14. Percent of out-of-county evacuees, by state destination

Florida	0
Georgia	2
South Carolina	9
North Carolina	73
Virginia	8
Alabama	0
Tennessee	1
Other (north of VA)	7

Going out of county (beyond the surge inundation limits) was motivated by three main factors: the strength of the storm, the location of friends and family, and the lack of closer motels (Table 15). In surge areas information from government officials conveyed by the media had about the same influence as other media information (Table 16). Outside the surge areas non-government information had a greater influence, although the small number of respondents in these areas diminishes the reliability of the data.

Table 15. Why Went Out of County

	Cat 1 Surge Zone N=66	Other Surge Zone N=61	Coastal County Non-surge N=18	Non-coastal Counties N=7
Strength of Storm	32	38	50	
Previous Hurri-cane Experience	11	8		
Comparisons to Hugo/Andrew	5			
Officials Said Leave County	5	2		
Media Said Leave County				
Friend Said Leave County	8	8	6	14
Friend Lives in Destination	53	49	44	71
No Public Shelter Closer				
No Motels Closer	9	7	17	
Other	14	16		14
Don’t Know	2	2		

Table 16. Greatest Influence for Going Out of County

	Cat 1 Surge Zone N=66	Other Surge Zones N=62	Coastal County Non-surge N=17	Non-coastal Counties N=8
Media Info from Gov't Officials	35	34	11	13
Other Media Info	32	36	41	38
Info from Friends	17	29	35	38
Other	20	8	12	13
Don't Know				

Ninety percent of the evacuees from most risk areas eventually reached their destinations (Table 17). Of those who changed destinations, most went someplace closer than anticipated (Table 18). Traffic was the main reason for changing destinations, but the figures are based on a small number of respondents (Table 19).

Table 17. Whether Reached Original Destination

	Cat 1 Surge Zone N=110	Other Surge Zones N=88	Coastal County Non-surge N=31	Non-coastal Counties N=30
Yes	93	93	87	93
No	7	6	10	7
Don't Know		1	3	

Table 18. Proximity of New Destination, Compared to Original Destination

	Cat 1 Surge Zone N=8	Other Surge Zones N=4	Coastal County Non-surge N=3	Non-coastal Counties N=2
Farther	13	25	33	100
Closer	75	75	67	
Same	13			
Don't Know				

Table 19. Why Changed Destination

	Cat 1 Surge Zone N=8	Other Surge Zones N=4	Coastal County Non-surge N=3	Non-coastal Counties N=2

Traffic	38	75	33	
Better Route			33	
Loc. of Refuge	13			50
Out of Gas				
Tired	13	50		
Hungry				
Bathroom				
Storm Strengthened	13			
Storm Close	13			
Other	38	25	67	50
Don't Know				

Most people said they did not hear about traffic problems on evacuation routes before leaving home (Table 20). Of those who heard about such problems before leaving home, most did not change their evacuation route plans (Table 21).

Table 20. Heard About Evacuation Route Problems Before Leaving Home

	Cat 1 Surge Zone N=111	Other Surge Zones N=87	Coastal County Non-surge N=31	Non-coastal Counties N=30

Yes	32	37	39	30
No	68	60	55	70
Don't Know		3	7	

Table 21. Changed Routes Because of Information Heard Before Leaving Home

	Cat 1 Surge Zone N=36	Other Surge Zones N=32	Coastal County Non-surge N=12	Non-coastal Counties N=9
Yes	25	34	25	44
No	75	66	75	56

Those who said they had heard about evacuation problems before leaving home were also asked whether they heard about such problems after leaving home. About half said they did, but responses varied among risk areas (Table 22). About a third of those changed their route plans accordingly (Table 23).

Table 22. Heard About Evacuation Route Problems After Leaving Home

	Cat 1 Surge Zone N=36	Other Surge Zone N=32	Coastal County Non-surge N=12	Non-coastal Counties N=9
Yes	56	38	50	33
No	42	59	50	67
Don't Know	3	3		

Table 23. Changed Routes Because of Information Heard After Leaving Home

	Cat 1 Surge Zone N=20	Other Surge Zones N=12	Coastal County Non-surge N=6	Non-coastal Counties N=3
Yes	15	33	33	67
No	85	67	67	33

Most evacuees did not use interstate highways for even part of their evacuation (Table 24). Those who used interstates in Floyd were inclined to use them again (Table 25). The great majority of the respondents said they were familiar with the roads in the area through which they evacuated (Table 26). More than three-fourths also said they would be willing to use a different route than they would normally use if government officials urged them to do so to avoid congestion, even if the route took them out of their way (Table 27). Only about 10% said they would be unwilling to comply with that sort of request by officials.

Table 24. Used Interstate for at Least Part of Route

	Cat 1 Surge Zone N=111	Other Surge Zones N=87	Coastal County Non-surge N=31	Non-coastal Counties N=30
Yes	42	41	35	17
No	56	59	65	83
Don't Know	2			

Table 25. Routes to be Used in the Future

	Cat 1 Surge Zone N=47	Other Surge Zones N=35	Coastal County Non-surge N=11	Non-coastal Counties N=5
Interstate	64	69	64	40
Secondary Roads	17	9		40
Both	4	3	9	
Depends on Traffic	9	6	9	
Depends on Other		9	18	
Other	4	3		
Don't Know	2	3		20

Table 26. Familiar with Roads in Area

	Cat 1 Surge Zone N=110	Other Surge Zones N=86	Coastal County Non-surge N=31	Non-coastal Counties N=30
Yes	86	84	74	90
No	13	15	23	10
Don't Know	1	1	3	

Table 27. Would Use Routes Advised by Officials, Even if Longer

	Cat 1 Surge Zone N=110	Other Surge Zones N=85	Coastal County Non-surge N=31	Non-coastal Counties N=30
Yes	85	73	87	83
No	2	11	3	10
Depends How Much Longer	3			3
Depends on Other	9	9	7	
Other		2		
Don't Know	2	5	3	3

Less than half the respondents said it took them five or more hours to reach their destination (Table 28). Still, times were longer than expected (Table 29). When asked how long it was reasonable for an evacuation like Floyd's to take, most respondents gave times shorter than the actual evacuation but slightly longer than their original expectation (Table 30).

Table 28. Hours Required to Reach Destination

	Cat 1 Surge Zone N=110	Other Surge Zones N=81	Coastal County Non-surge N=30	Non-coastal Counties N=30
Less than 2	54	44	53	83
2 to 5	27	23	20	10
5 to 10	17	28	27	0
10 or more	2	5	10	10
Mean No. Hrs	2.5	3.7	3.1	2.4
Median No. Hrs	1.0	3.0	1.0	.5

Table 29. Hours Expected to Reach Destination

	Cat 1 Surge Zone N=107	Other Surge Zones N=79	Coastal County Non-surge N=30	Non-coastal Counties N=30
Less than 2	55	47	60	86
2 to 5	38	38	20	10
5 to 10	7	14	17	0
10 or more	0	1	3	4
Mean No. Hrs	1.9	2.7	2.5	1.9

Median No. Hrs	1.0	2.0	1.0	.5

Table 30. Hours Reasonable to Reach Destination

	Cat 1 Surge Zone N=108	Other Surge Zones N=78	Coastal County Non-surge N=30	Non-coastal Counties N=30
Less than 2	50	41	48	92
2 to 5	32	28	31	4
5 to 10	18	27	14	4
10 or more	0	4	7	0
Mean No. Hrs	2.5	3.4	2.7	1.1
Median No. Hrs	1.0	3.0	2.0	.5

Most people thought the traffic delays were caused mainly by the sheer volume of traffic, the fact that too many people left at once, and bad weather (Table 31). Some also cited poor traffic management, and a few advocated reversing lane directions. More than 80% of the respondents said they would be willing to cooperate in a phased evacuation in which they would delay their departure for a few hours until people in a more dangerous location had begun their evacuation (Table 32).

Table 31. Why Traffic Was Slow

	Cat 1 Surge Zone N=105	Other Surge Zones N=85	Coastal County Non-surge N=31	Non-coastal Counties N=30

Number of Cars	38	34	30	13
All Left at Once	27	22	27	30
Waited too Long	7	4	10	7
Construction	2	5	10	
Accidents	8	5		3
Poor Traffic Management	11	18	7	3
Need Reverse Lanes	4	2	3	
Bad Weather	22	8	23	23
Other	18	25	7	30
Don't Know	16	20	13	23

Table 32. Would Delay Departure if Urged by Officials

	Cat 1 Surge Zone N=195	Other Surge Zones N=198	Coastal County Non-surge N=103	Non-coastal Counties N=101
Yes	83	81	83	84
Depends on Storm's Proximity	5	6	2	3

Depends on Storm's Strength	3	2	5	1
Other		1		
Don't Know	3	5	8	5
No	7	6	3	7

Most evacuees did not cite specific difficulties experienced during the evacuation. Needing restroom facilities was most common, but a few ran out of gas or had mechanical breakdowns (Table 33). About half of the evacuees said they heard about places where they could find shelter if they weren't able to reach their destinations (Table 34). Few changed their plans about seeking shelter as a result (Table 35). Most interviewees reported roads being blocked by water when returning from the evacuation (Table 36).

Table 33. Difficulties Experienced in Evacuation

	Cat 1 Surge Zone N=111	Other Surge Zones N=89	Coastal County Non-surge N=30	Non-coastal Counties N=30
Ran Out of Gas	1	2		3
Car Broke Down		1		
Needed Water	2	1		
Needed Food	2	4		3
Needed Restroom	5	5	10	3
Other Difficulties	3			
No Difficulties	91	92	90	93

Table 34. Heard About Refuge Options After Leaving Home

	Cat 1 Surge Zone N=110	Other Surge Zones N=86	Coastal County Non-surge N=31	Non-coastal Counties N=30
Yes	46	47	58	53
No	53	50	42	47
Don't Know	1	4		

Table 35. Changed Plans Because of Refuge Information Heard After Leaving Home

	Cat 1 Surge Zone N=51	Other Surge Zones N=38	Coastal County Non-surge N=18	Non-coastal Counties N=15
Yes	2		6	13
No	98	100	94	87

Table 36. Difficulties Experienced Returning from Evacuation

	Cat 1 Surge Zone N=111	Other Surge Zones N=86	Coastal County Non-surge N=30	Non-coastal Counties N=30

Lack of Information	7	7	7	
Roads Blocked by Water/Debris	55	57	67	57
Traffic Congested	6	8		
Re-entry Not Permitted	14	4	10	13
Other Difficulties	5	6		10
No Difficulties	34	38	30	40

Vehicle use was typical of most evacuations, in which 65% to 75% of the available vehicles are used (Table 37). Few households required assistance in evacuating, and in most instances outside agencies were not required (Table 38).

Table 37. Vehicle Use by Evacuating Households

	Cat 1 Surge Zone N=110	Other Surge Zones N=86	Coastal County Non-surge N=31	Non-coastal Counties N=41
Percent of Available	69	58	57	64
Avg. Number Per Household	1.36	1.21	1.32	1.20

Pulled Trailer, Took Motorhome	9	2	0	0

Table 38. Required Assistance in Evacuating (As a Percent of All Households)

	Cat 1 Surge Zone N=196	Other Surge Zones N=199	Coastal County Non-surge N=103	Non-coastal Counties N=102
Yes, Within Household	1			
Yes, Friend/ Relative	2	3		1
Yes, Agency				2
No	97	97	100	97

Local television was relied upon most heavily by the respondents for information about Floyd, followed by The Weather Channel (Table 39). Local radio was the third most relied-upon source of information.

Table 39. Sources Relied On a Great Deal for Information about Floyd

	Cat 1 Surge Zone N=194	Other Surge Zones N=199	Coastal County Non-surge N=103	Non-coastal Counties N=102

Local Radio	39	29	31	44
Local Television	75	76	78	76
CNN	21	15	14	21
Weather Channel	71	73	59	43
Other Cable	7	6	7	12
Internet	6	10	6	4
AOL	1	5	2	1
Word of Mouth	11	9	7	13

Most respondents in the sample said they wouldn't do anything differently if faced with the same circumstances again as in Floyd (Table 40). Some who left wouldn't, but some who didn't leave would. Some would plan to leave earlier.

Table 40. Would Do Differently Next Time

	Cat 1 Surge Zone N=194	Other Surge Zones N=198	Coastal County Non-surge N=103	Non-coastal Counties N=102
Would Leave	4	7	5	3
Wouldn't Leave	8	12	6	4
Leave Earlier	8	8	6	6
Leave Later	3	1		1
Go Farther	1	1	2	
Go Closer	3	1	1	1
Use Public Shelter			1	

Not Use Pub Shltr	1			
Different Route	1	2	1	
Buy Gasoline	1	1		1
Take Provisions	3	1		2
Other	7	6	12	9
Don’t Know	3	1	1	2
Nothing Different	68	69	71	78

Hurricane Floyd Response Questionnaire

Dade/Broward, Florida

Hello, my name is _____ and I'm calling on behalf of the Army Corps of Engineers and your state emergency management office. I'm conducting a telephone survey of residents concerning experiences in hurricane Floyd last summer, so that we can improve hurricane evacuation plans for the future. May I please speak with the **(ROTATE):**

1. Youngest male over 18

2. Oldest male

3. Youngest female over 18

4. Oldest female in your household?

My questions will only take a few minutes. Your responses are important to us so that we may have accurate information about hurricane preparedness. Before we begin, let me assure you everything you say will remain strictly confidential.

1. Do you live at this residence year-round?

__1__ Yes **(GO TO Q3)**

__2__ No **(GO TO Q2)**

__3__ Other **(GO TO Q2)**

2. Do you live here at least part of the time during the summer or fall?

__1__ Yes **(GO TO Q3)**

__2__ No **(THANK & TERMINATE)**

__3__ Other **(THANK & TERMINATE)**

IF "NO," TERMINATE THE INTERVIEW BY RESPONDING "THANK YOU FOR YOUR TIME, BUT WE ARE LOOKING FOR PEOPLE WHO ARE IN THIS REGION DURING THAT TIME FRAME. THANK YOU AGAIN. GOODBYE.

3. Were you in the area, i.e., not out of town, when **HURRICANE FLOYD** began to threaten your area last September?

__1__ Yes **(GO TO Q4)**

__2__ No **(THANK AND TERMINATE)**

__3__ Other **(THANK AND TERMINATE)**

IF "NO," TERMINATE THE INTERVIEW BY RESPONDING "THANK YOU FOR YOUR TIME, BUT WE ARE LOOKING FOR PEOPLE WHO WERE IN THIS AREA AT THAT TIME. THANK YOU AGAIN. GOODBYE."

4. Did you leave your home to go someplace safer in response to the threat created by Hurricane Floyd?

__1__ Yes **(GO TO Q6)**

__2__ No **(GO TO Q5)**

__3__ Other, _____ **(GO TO Q44)**

9 Don't know **(GO TO Q44)**

5. What made you decide *not* to go anyplace else? **(CATEGORIZE - PROBE UP TO 3) (THEN GO TO Q44)**

a 0/1 Storm not severe/house adequate

b 0/1 Officials said evacuation unnecessary

c 0/1 Media said evacuation unnecessary

d 0/1 Friend/relative said evacuation unnecessary

e 0/1 Officials didn't say to evacuate

f 0/1 Probabilities indicated low chance of a hit

g 0/1 Other information indicated storm wouldn't hit

h 0/1 Had no transportation

i 0/1 Had no place to go

j 0/1 Wanted to protect property from looters

k 0/1 Wanted to protect property from storm

l 0/1 Left unnecessarily in past storms

m 0/1 Job required staying

n 0/1 Waited too long to leave

o 0/1 Traffic too bad

p 0/1 Tried to leave, but returned home because of traffic

q 0/1 Too dangerous to evacuate because might get caught on road in storm

r 0/1 No place to take pets/Shelter would not accept pets

s 0/1 Required special medical care

t 0/1 Other, specify: _____

u 0/1 Don't know

5v. **IF** Floyd had looked to you like it was going to hit this area more directly, would you have left your home to go someplace safer?

1 Yes

2 No

3 Don't Know/Depends

4 Other (Specify)_____

5w. Were you ready, that is had you made the necessary preparations, to leave your home to go someplace safer in the event the situation had worsened?

1 Yes

2 No

3 Don't Know/Depends

4 Other (Specify)_____

5x. Would you or anyone in your household require assistance in evacuating?

1 Yes

2 No **(SKIP TO Q 44)**

3 Not sure **(SKIP TO Q 44)**

5y. Would the person just need transportation, or do they have a disability or medical

problem that would require special assistance?

__1__ Transportation only

__2__ Special need (disability or medical problem)

__3__ Both

__4__ Other, specify: _____

__5__ Don't know

5z. Would that assistance provided by someone within your household, or by an outside agency, or by a friend or relative outside your household?

__1__ Within household

__2__ Friend/relative (outside)

__3__ Outside agency

__4__ Other, _____

__9__ Don't know

(IF ANSWERING Q5z, SKIP TO Q44)

****

6. What convinced you to go leave your home to go someplace safer? **(CATEGORIZE - PROBE UP TO 3)**

a __0/1__ Advice or order by elected officials

b __0/1__ Advice from Weather Service

c __0/1__ Advice/order from police officer or fire fighter

d __0/1__ Advice from media

e 0/1 Advice from friend or relative

f 0/1 Concerned about severity of storm

g 0/1 Storm as strong as/stronger than/bigger than Andrew/Hugo

h 0/1 Storm increased in strength

i 0/1 Concerned storm would cause home to flood

k 0/1 Concerned strong winds would make house unsafe

l 0/1 Concerned flooding would cut off roads

m 0/1 Concern that storm might hit

n 0/1 Heard probability (odds) of hit

o 0/1 Wanted to avoid conditions after the storm (no electricity, etc.)

p 0/1 Other, specify: _____

q 0/1 Don't know

7. Which of the following would you say had the GREATEST influence on your decision to leave your home to go someplace safer? (**READ – RECORD ALL MENTIONED**)

a 0/1 Information from government officials

b 0/1 Information from the media, **NOT COUNTING** THE MEDIA'S COVERAGE OF WHAT GOVERNMENT OFFICIALS WERE SAYING

c 0/1 Information from friends/relatives

d 0/1 Other factors

e 0/1 Other, _____

f 0/1 Don't know

8a. **FOR DADE/BROWARD, FLORIDA:**

The National Hurricane Center issued a Hurricane Watch for this area at 5 AM on the morning of Monday, September 13th for Broward and 11 AM for Dade. That was followed by a Hurricane Warning later that same day at 5 PM. On what day did you leave your home to go someplace safer?

1 Sunday, September 12th or earlier

2 Monday, September 13th

3 Tuesday, September 14th

4 Wednesday, September 15th

5 Thursday, September 16th

6 Other _____

9 Don't know

8b. About what time on the **(REPEAT DATE)** did you leave? **(USE 1 HOUR INCREMENTS) (TAKE MIDPOINT) (99=DK)**

_____ Hour **(IF 99, SKIP TO Q13)**

8c. Was that morning AM or PM? (**NOTE: 12 O'CLOCK NOON = 12 PM)**

(NOTE: 12 O'CLOCK MIDNIGHT = 12 AM ON THE "NEW" DAY)

__1__ AM (morning / or midnight until noon)

__2__ PM (afternoon/evening or noon until midnight)

9. Did you go to a public shelter, a friend or relative's house, a hotel, or somewhere else? **(DO NOT READ)**

__1__ Public shelter (Red Cross) (**GO TO Q. 10**)

__2__ Church **(SKIP TO Q. 12)**

__3__ Friend/relative **(SKIP TO Q. 12)**

__4__ Hotel **(SKIP TO Q.12)**

__5__ Workplace **(SKIP TO Q.12)**

__6__ Mobile home park clubhouse **(SKIP TO Q. 12)**

__7__ Other, specify: **(SKIP TO Q. 12)**

9 Don't know **(SKIP TO Q. 12)**

10. Why did you go to a public shelter rather than going someplace else? **(CATEGORIZE – PROBE UP TO 3)**

a 0/1 Close to home

b 0/1 Safer than home/ther places

c 0/1 Not enough time to get to anyplace else

d 0/1 Couldn't find motel with vacancy

e 0/1 Got tired of driving

f 0/1 Couldn't afford hotel/motel

g 0/1 Had no place else to go

h 0/1 Officials recommended going to public shelter

i 0/1 Media recommended going to public shelter

j 0/1 Friend/relative recommended going to public shelter

k 0/1 Other, specify: _____

l 0/1 Don't Know

11. Do you have a friend or relative in your own county who lives in a well-built home in a safe location that you could have stayed with when you evacuated instead of going to a public shelter?

1 Yes

2 No

9 Don't know

12. Is that **(ANSWER FROM #9)** located in your neighborhood or someplace else?

1 Neighborhood **(SKIP TO Q18)**

2 Somewhere else

9 Don't know

13. In which city is that located?

_____

14. Is that **(ANSWER FROM #13)** located in your county?

1 Yes **(SKIP TO Q18)**

2 No

9 Don't know

15. In which state is that located?

1 Florida

2 Georgia

3 South Carolina

4 North Carolina

5 Alabama

6 Tennessee

7 Virginia

8 Other, _____

9 Don't know

16. Why did you go so far – that is, to a destination outside your own county? **(CATEGORIZE - PROBE UP TO 3)**

a 0/1 Storm strong; needed to go that far to be safe

b 0/1 Previous hurricane experience (e.g., Andrew/Hugo)

c	0/1	Government officials comparison to Andrew/Hugo
d	0/1	Media officials comparison to Andrew/Hugo
e	0/1	Officials, emergency management said to leave county
f	0/1	Media said to leave county
g	0/1	Friend/relative said to leave county
h	0/1	Friend/relative lives (lived) there
i	0/1	No public shelters available closer
j	0/1	No motels available closer
k	0/1	Other, _____
l	0/1	Don't know

17. Which of the following would you say had the GREATEST influence on your decision to go someplace outside your own county? (**READ – RECORD ALL MENTIONED**)

a 0/1 Information from government officials

b 0/1 Information from the media, **NOT COUNTING** THE MEDIA'S COVERAGE OF WHAT GOVERNMENT OFFICIALS WERE SAYING

c 0/1 Information from friends/relatives

d 0/1 Other factors

e 0/1 Other, _____

f 0/1 Don't know

18. Was that your original destination when you set out to evacuate, or did you change your mind about where to go after leaving home?

1 Changed destination **(GO TO Q19)**

_2_ Reached original destination **(SKIP TO Q121)**

_9_ Don't Know **(SKIP TO Q21)**

19. Did you end up going farther from home than you had planned or not as far?

_1_ Farther

_2_ Not as far

_3_ About the same distance

_9_ Don't Know

20. What caused you to change your mind about where to go? **(CATEGORIZE; PROBE UP TO 3)**

a _0/1_ Traffic congestion

b _0/1_ Information about better routes

c _0/1_ Information about available shelter or lodging

d _0/1_ Running out of gasoline

e _0/1_ Tired of being on road

f _0/1_ Hungry

g _0/1_ Needed to use bathroom

h _0/1_ Storm getting too close to continue

i _0/1_ Storm got stronger

j _0/1_ Other; specify:_____

k _0/1_ Don't know

21. Before you left your home, did you hear any announcements about traffic problems on routes you planned to use?

_1_ Yes **(GO TO Q22)**

_2_ No **(SKIP TO Q23)**

_9_ Don't Know **(SKIP TO Q23)**

22. Did you change your plans as to which routes to use after hearing that?

_1_ Yes

_2_ No

_9_ Don't Know

23. After you left your home and were on the road, did you hear any announcements about traffic problems on routes you were using or planned to use?

_1_ Yes **(GO TO Q24)**

_2_ No **(GO TO Q25)**

_9_ Don't Know **(GO TO Q25)**

24. Did you change your plans as to which routes to use after hearing that?

_1_ Yes

_2_ No

_9_ Don't Know

25. Did you use interstate highways for a significant part of your travel after you got out of town?

_1_ Yes **(GO TO Q26)**

_2_ No **(GO TO Q27)**

_9_ Don't Know **(GO TO Q27)**

26. Would you use the interstate highways again in future evacuations, or would you be more likely to use secondary highways?

_1_ Interstate

_2_ Secondary

_3_ Both

_4_ Depends on congestion

_5_ Depends on other factors

_6_ Other, _____

_9_ Don't Know

27. Were you familiar enough with the roads in the area where you were traveling so that you could change to a different route if you wanted to?

_1_ Yes

_2_ No

_9_ Don't Know

28. Suppose that government officials urged you to use a different route than you would normally use, in order to avoid congestion. Would you be willing to use a route recommended by officials, even if it took you out of your way before getting you to your destination?

_1_ Yes

_2_ No

_3_ Depends

_4_ Other, _____

_9_ Don't Know

29. After you left your home and were on the road, did you hear any announcements about places you could seek shelter in case you couldn't reach your destination?

_1_ Yes **(GO TO Q30)**

_2_ No **(GO TO Q31)**

_9_ Don't Know **(GO TO Q31)**

30. Did you change your plans about where to seek shelter after hearing that?

_1_ Yes

_2_ No

_9_ Don't Know

31. How long did it take you to get to where you were going? **(WAS IT MORE OR LESS THAN 2 HOURS?) (USE 1 HOUR INCREMENTS) (TAKE MIDPOINT) (88.8=NEVER GOT THERE) (99.9=DK) (ROUND TO NEAREST ½ HOUR)**

_____ Hours

32. How long did you EXPECT it take you to get to where you were going? **(WAS IT**

MORE OR LESS THAN 2 HOURS?) (USE 1 HOUR INCREMENTS) (TAKE MIDPOINT) (99.9=DK) (ROUND TO NEAREST ½ HOUR)

_____ Hours

33. How long do you think it's REASONABLE to take to get to where you were going in a big evacuation like Floyd? **(WOULD IT BE MORE OR LESS THAN 2 HOURS?) (USE 1 HOUR INCREMENTS) (TAKE MIDPOINT) (99.9=DK) (ROUND TO NEAREST ½ HOUR)**

_____ Hours

34. In places where traffic was moving very slowly, what do you believe was the main cause for the delays? **(CATEGORIZE; PROBE UP TO 3)**

a 0/1 Heavy traffic

b 0/1 Too many people left at one time

c 0/1 Too many people waited too long to leave

d 0/1 Road construction

e 0/1 Traffic accidents

f 0/1 Poor traffic management

g 0/1 Needed to use all available lanes for evacuating traffic (i.e., one-way)

h 0/1 Bad weather

i 0/1 Other, _____

j 0/1 Don't Know

35. While on the road during the evacuation, did you experience any difficulties such as running out of gasoline, your car breaking down, or needing food, water, or a restroom? **(CATEGORIZE – PROBE UP TO 3)**

a 0/1 Yes, ran out of gasoline

b 0/1 Yes, car broke down/overheated

c 0/1 Yes, needed water

d 0/1 Yes, needed food

d 0/1 Yes, needed restroom

e 0/1 No

f 0/1 Other,_____

g 0/1 Don't Know

36. After the storm had passed, did you have any difficulties returning to your home? **(CATEGORIZE – PROBE UP TO 3)**

a 0/1 Yes, couldn't get information about returning home (when/how)

b 0/1 Yes, roads were blocked by damage or flooding

c 0/1 Yes, traffic was congested returning (i.e., traffic delays)

d 0/1 Yes, authorities wouldn't allow entry into damaged neighborhood

e 0/1 No

f 0/1 Other

g 0/1 Don't Know

37. Did you or anyone in your household require assistance in evacuating?

1 Yes

2 No **(SKIP TO Q40)**

3 Not sure **(SKIP TO Q40)**

38. Did the person just need transportation, or did they have a disability of medical problem that required special assistance?

__1__ Transportation only

__2__ Special need (disability or medical problem)

__3__ Both

__4__ Other, specify: _____

__5__ Don't know

39. Was that assistance provided by someone within your household, or by an outside agency, or by a friend or relative outside your household?

__1__ Within household

__2__ Friend/relative (outside)

__3__ Outside agency

__4__ Other, _____

__9__ Don't know

40. How many vehicles were available in your household that you could have used to evacuate?

_____ Number of vehicles **(IF 0, GO TO Q41; OTHERWISE GO TO Q42)**

(9 = DK) (IF 1 OR MORE IN Q40, SKIP TO Q42) (8 =NA)

(RECORD "0" IF NO VEHICLES ARE AVAILABLE)

41. Did your household members leave in someone else's vehicle, did they use public transportation, or did you evacuate another way?

__1__ Other's vehicles **(GO TO Q44)**

__2__ Public transportation **(GO TO Q44)**

__3__ Other, specify: _____ **(GO TO Q44)**

__9__ Don't know **(GO TO Q44)**

42. How many vehicles did your household take in evacuating? **(9 = DK) (8 =NA) (RECORD "0" IF NO VEHICLES WERE TAKEN)**

_____ Number of vehicles

43. When you evacuated, did you take a motor home or pull a trailer, boat, or camper?

__1__ Yes

__2__ No

__3__ Other, specify: _____

__9__ Don't know

****

44. During the threat, did you hear either directly or indirectly anyone in an official position - such as elected officials, emergency management, police, etc. - say that you **should** evacuate from your location to a safer place?

__1__ Yes **(GO TO Q45)**

__2__ No **(GO TO Q47)**

__9__ Don't know **(GO TO Q47)**

45. Did officials recommend that you **should** evacuate or did they say it was mandatory that you **must** evacuate?

__1__ Should

__2__ Must

__9__ Don't know

46. Did police or other authorities come into your neighborhood going door-to-door or with loudspeakers, telling people to evacuate?

__1__ Yes

__2__ No

__9__ Don't know

47. Considering your experiences in Floyd, what would you do differently in the future, given the same kind of situation as you faced in Floyd? **(CATEGORIZE) (PROBE UP TO 4)**

a __0/1__ Would evacuate

b __0/1__ Wouldn't evacuate

c 0/1 Would leave earlier

d 0/1 Would wait until later to leave

e 0/1 Would go further away

f 0/1 Wouldn't go as far away

g 0/1 Would go to public shelter

h 0/1 Wouldn't go to public shelter

i 0/1 Would use different route

j 0/1 Would fill up with gasoline before leaving

k 0/1 Would take food, medicine, other supplies

l 0/1 Nothing different

m 0/1 Other, specify: _____

n 0/1 Don't know

48. Suppose that in the future, public safety officials used a phased or staged evacuation system in your area. The idea would be to avoid too many people getting on the road at the same time and causing the roads to get clogged with traffic. If officials asked that you delay your departure for a few hours until after people from a more dangerous location in your area had begun their evacuation, would you be willing to do that?

1 Yes

2 Depends on proximity of the storm

3 Depends on strength of the storm

4 Depends on other factors

5 Other, _____

6 No

9 Maybe/Don't know

49. We're interested in how you got most of your information about Floyd - where the storm was; when it was going to hit; how severe it was. I'm going to list a number of different ways you might have gotten information, and I'd like you to tell me whether you relied upon that source none at all (0), a little (1), a fair amount (2), or a great deal (3). **(READ & ROTATE)**

	None	Little	Fair Amount	Great Deal	
a	0	1	2	3	Local radio stations
b	0	1	2	3	Local television stations
c	0	1	2	3	CNN on cable
d	0	1	2	3	The Weather Channel on cable
e	0	1	2	3	Other cable stations
f	0	1	2	3	The Internet r **(DO YOU HAVE A COMPUTER WITH A MODEM**)
g	0	1	2	3	Services like American Online or Compuserve r **(DO YOU HAVE A COMPUTER WITH A MODEM**)
h	0	1	2	3	Word of mouth

IF "0" TO ALL, SKIP TO Q 54

50. Of those sources of information, did you find any one of them to have **more** accurate or useful information than the others?

__1__ Yes

__2__ No **(SKIP TO Q52**)

__3__ Don't Know/Not Sure **(SKIP TO Q52**)

51. Which one was that?

__1__ Local radio stations

__2__ Local television stations

__3__ CNN on cable

__4__ The Weather Channel on cable

__5__ Other cable channel

__6__ The Internet

__7__ Computer services like American Online or CompuServe

__9__ Don't know

52. Of those sources of information, did you find any one of them to have **less** accurate or useful information than the others?

__1__ Yes

__2__ No **(SKIP TO Q54)**

__9__ Don't Know/Not Sure **(SKIP TO Q54**)

53. Which one was that?

__1__ Local radio stations

__2__ Local television stations

__4__ CNN on cable

__5__ The Weather Channel on cable

__3__ Other cable channel

__6__ The Internet, if you have a computer

__7__ Computer services like American Online or CompuServe, if you have a computer

__8__ All equally inaccurate

__9__ Don't know

54. Did you or anyone in your household have to go to work while the Floyd evacuation was going on?

__1__ Yes (**GO TO Q55)**

__2__ No (**SKIP TO Q56)**

__9__ Don't Know (**SKIP TO Q56)**

55. How did that affect the way your household responded during the evacuation?

__1__ Not at all

__2__ Kept household from evacuating

__3__ Kept part of household from evacuating

4 Delayed household from evacuating

5 Delayed part of household from evacuating

6 Other,

_____

9 Don't Know

56. At one point Floyd's maximum sustained winds were 155 MPH. That's almost a category 5 hurricane, stronger than hurricane Andrew. If Floyd had made landfall near your location with winds of 155 MPH, do you believe your home would have been at risk to dangerous flooding from storm surge or waves?

1 Yes

2 No

9 Don't Know/Depends

57. Considering both wind and water, do you think it would have been safe for you to have stayed in your home if Floyd had hit near your location with winds of 155 MPH?

1 Yes

2 No

9 Don't Know/Depends

58. Later, Floyd's maximum sustained winds decreased to 125 MPH. That's a strong category 3 hurricane, almost as strong as hurricane Hugo. If Floyd had made landfall near your location with winds of 125 MPH, do you believe your home would have been at risk to dangerous flooding from storm surge or waves?

1 Yes

2 No

9 Don't Know/Depends

59. Considering both wind and water, do you think it would have been safe for you to have stayed in your home if Floyd had hit near your location with winds of 125 MPH?

1 Yes

2 No

9 Don't Know/Depends

60. In Floyd, what kinds of steps, if any, did you take before the storm arrived to protect your property? **(CATEGORIZE) (PROBE UP TO 3)**

a 0/1 Apply window protection

b 0/1 Apply door/garage door protection

c 0/1 Secure or remove loose objects from yard

d 0/1 Move boat, camper, etc.

e 0/1 Prepare pool

f 0/1 Elevate furniture, appliance, rugs, etc.

g 0/1 Protect documents, photos, etc.

h 0/1 Sandbag property

i 0/1 Purchase items for repair after/during storm (plastic film, plywood)

j 0/1 Buy/rent generator

k 0/1 Secure plants

l 0/1 Cut limbs

m 0/1 Other (Specify)_____

n 0/1 None

o 0/1 Don't Know/Not Sure

61. Have you identified the safest location in your home to ride out a strong hurricane if you had to?

1 Yes

2 No

9 Don't Know/Not Sure

62. Do you have any kind of window protection such as storm shutters, security film, or plywood sheets designed to protect the windows during a strong hurricane?

1 Yes **(GO TO Q63)**

2 No **(SKIP TO Q64)**

9 Don't Know/Not Sure **(SKIP TO Q64)**

63. What kind of protection is it?

1 Permanent roll-down metal panels

__2__ Removable metal panels

__3__ Plywood sheets

__4__ Security Film

__5__ Impact-resistant glass

__6__ Other

__9__ Don't Know/Not Sure

IF ANSWERING Q63, SKIP TO Q65

64. If not, why not? **(CATEGORIZE)**

__1__ Don't need it

__2__ Too expensive

__3__ Don't think it works

__4__ Don't have enough time to do it

__5__ Other (specify) _____

__9__ Don't know

65. About how much do you think window protection such as storm shutters would cost per window? **(PAUSE - READ IF NECESSARY)**

__1__ Under $10

__2__ $10 to $50

__3__ $50 to $100

__4__ $100 to $200

__5__ $200 to $500

__6__ Over $500

__9__ Don't Know/Not Sure

66. Do you believe window protection like that would mainly just prevent the windows from breaking and reduce the danger of flying glass, or do you believe they would also significantly reduce the total damage your house would suffer in other ways?

__1__ Mainly Windows

__2__ Total Damage Also

__9__ Don't Know/Not Sure

67. Other than window protection, what permanent improvements, if any, have you made to your home to reduce the damage to your property in a hurricane? **(CATEGORIZE) (PROBE UP TO 2)**

a __0/1__ Roof/truss Strengthening

b __0/1__ Door/Garage Door Protection

c __0/1__ Flood proofing

d __0/1__ Other (Specify)_____

e __0/1__ None

f 0/1 Don’t Know/Not Sure

68. Is your home or building elevated on pilings or fill material to raise it above flood water?

1 Yes

2 No

9 Don't Know/Not Sure

69. How much money do you plan to spend **this year** on changes to your home to make it stronger or safer from hurricanes? **(999=DK)**

$_____

70. If your homeowners insurance company offered to reduce the price of your insurance premium by 15% if you were to make your home stronger by installing permanent window protection such as storm shutters, would you be willing to it?

(IF NO, PROBE WHY NOT)

1 Yes

2 No, already have window protection

3 No, would cost more than it saved

4 No, would look unattractive

5 No, don’t need them in this area

6 No, don’t own home

7 No, other

8 Depends on Cost/Savings

9 Don’t Know

71. What was the most damage, in dollars, you've ever experienced to your property as the result of a hurricane?

__1__ None

__2__ Less than $1,000

__3__ $1,000 to $4,999

__4__ $5,000 to $9,999

__5__ $10,000 to $24,999

__6__ $25,000 to $49,999

__7__ $50,000 or more

__8__ Don't Know/Refused

NOW WE HAVE JUST A FEW MORE QUESTIONS FOR BACKGROUND PURPOSES ONLY.

72. Which of the following types of structures do you live in? Do you live in a: **(READ)**

__1__ Detached single family home?

__2__ Duplex, triplex, quadaplex home?

__3__ Multi-family building -- 2 stories or less? (Apartment/condo)

__4__ Multi-family building – 3 to 6 stories (Apartment/condo)

__5__ Multi-family building – more than 6 stories (Apartment/condo)

__6__ Some other type of structure

__9__ Don't Know

10 Refused

73. How close do you live to the beachfront? **(READ)**

1 On the Beachfront?

2 One block or less?

3 More than a block but less than a mile

4 More than a mile

9 Don't Know

10 Refused

74. How close do you live any other water body such as a bay, river, or sound? **(READ)**

1 On the waterfront?

2 One block or less?

3 More than a block but less than a mile

4 More than a mile

9 Don't Know

10 Refused

75. How old were you on your last birthday?

____ Number of years **(99 = DK)** (88=REFUSED)

76. How long have you lived in your present home? **(ROUND UP) (99 = DK)** (88=REFUSED)

____ Number of years

77. How long have you lived in the Tampa Bay Region? **(ROUND UP) (99 = DK)** (88=REFUSED)

____ Number of years

78. How many people live in your household, including yourself? **(99 = DK)** (88=REFUSED)

____ Number of people **(IF 1, SKIP TO Q60)**

79. How many of these are children, 17 or younger? **(99 = DK)** (88=REFUSED)

____ Number of children

80. Do you own your home or rent?

__1__ Own

__2__ Rent

__3__ Other

81. Do you have any pets?

__1__ Yes

__2__ No

__9__ Refused

82. Which race or ethnic background best describes you? **(READ)**

__1__ African American or Black

__2__ Asian

__3__ Caucasian or White

__4__ Hispanic

__5__ American Indian

__6__ Other _____

__9__ Refused

83. Which of the following ranges best describes your total household income for 1996? **(READ)**

__1__ Less than $15,000

__2__ $15,000 to $24,999

__3__ $25,000 to $39,999

__4__ $40,000 to $79,999

__5__ Over $80,000

__9__ Refused

84. Which category best describes your education level?

__1__ Some high school

__2__ High school graduate

__3__ Some college

__4__ College graduate

__5__ Post graduate

__9__ Refused

Thank you so much. Sometimes my supervisor will call people to check on my work. May I get your first name in case she wants to check?

85. _____

RECORD INTERVIEW INFORMATION ON RESPONDENT DISPOSITION SHEET

86. Sex of respondent __1__ Male __2__ Female

87. Interviewer ID _____

88. Date of survey _____

89. Phone number _____

90. Risk Zone 1 = High Risk/Cat 1

2= Moderate Risk/Cat 3-5

3= Coastal Non-Surge

4=Non-coastal

91. State 1 = Florida

2 = Alabama

3 = Mississippi

4 = Louisiana

92. Sample Area

1 = Dade/Broward, Florida

2 = Treasure Coast, Florida

3 = East Central, Florida

4 = Northeast, Florida

5 = Brunswick, Georgia

6 = Savannah, Georgia

7 = Beaufort, South Carolina

8 = Charleston, South Carolina

9 = Myrtle Beach, South Carolina

10 = Southeast, North Carolina

11 = Northeast, North Carolina

Hurricane Floyd 1999 Behavioral Studies

Method

During the months following hurricane Floyd, nearly 7,000 members of the public were interviewed to document and explain their response in Floyd and to help anticipate their behavior in future evacuations like Floyd. The sample was divided into 11 clusters of counties from Dade County, Florida through North Carolina's Outer Banks, designed to conform to hurricane planning regions used by the respective states:

1. Eastern North Carolina – the Outer Banks and counties along Albemarle and Pamlico Sounds
2. Southeastern North Carolina – from the South Carolina border to the Outer Banks, including Wilimington
3. Northern South Carolina – including the Myrtle Beach "Grand Strand" area
4. Central South Carolina – including Charleston and vicinity
5. Southern South Carolina – including the Beaufort area
6. Northern Georgia – including Savannah
7. Southern Georgia – including Brunswick and Camden County
8. Northeast Florida – including Jacksonville and St. Augustine
9. East-Central Florida – including Daytona Beach and Melbourne
10. Treasure Coast Florida – including Palm Beach and Fort Pierce
11. Southeast Florida – Dade and Broward Counties

Each of the eleven areas was stratified into four risk areas, with the following numbers of interviews conducted in each risk area of each of the eleven county clusters:

1. Areas which would flood due to storm surge in category 1 hurricanes, in which 200 telephone interviews were conducted
2. Areas which would flood due to storm surge in stronger hurricanes, in which 200 telephone interviews were conducted
3. Areas of coastal counties which would not flood from storm surge in any hurricane, in which 100 telephone interviews were conducted
4. Non-coastal counties bordering the coastal counties, in which 100 telephone interviews were conducted.

In southeast Florida 200 interviews were conducted in the non-surge portion of the coastal counties rather than including non-coastal counties. In southern Georgia, virtually the entire coastal counties are subject to storm surge inundation in strong hurricanes, so there was no identification of non-surge portions of those counties. In eastern North Carolina the Outer Banks were treated in the design and analysis like the category 1 risk area of other locations, and areas along the sounds subject to surge inundation were treated as "other surge" areas for comparison with the other locations.

A generic version of the questionnaire used in the survey is included as an appendix to this report. Separate reports were prepared for each of the 11 areas, going into more detail than that which is covered here. For conciseness, sample sizes are not reported in the figures cited in this summary document. Readers should keep in mind that statistics reported here are

based on samples derived from larger populations. For more information about sample sizes employed for each question in each location and each risk zone, please refer to the individual area reports.

Evacuation Timing

Figure 1 - Evacuation Timing in Floyd

Figure 1 gives a sample of the "cumulative response curves" derived for each of the 11 areas. The vertical axis indicates the percentage of total evacuees from a location who had departed their homes by various times. The four curves show the progression of the evacuation commencing earlier to the south and gradually moving northward as the forecast track of the storm and warning areas moved northward. The curves are typical of "two-day" response curves – i.e., evacuations which take place over a period longer than 24 hours. The evacuation begins early on the first day, levels off at evening of the first day, then resumes the following day. Little evacuation began prior to evacuation notices being issued by officials.

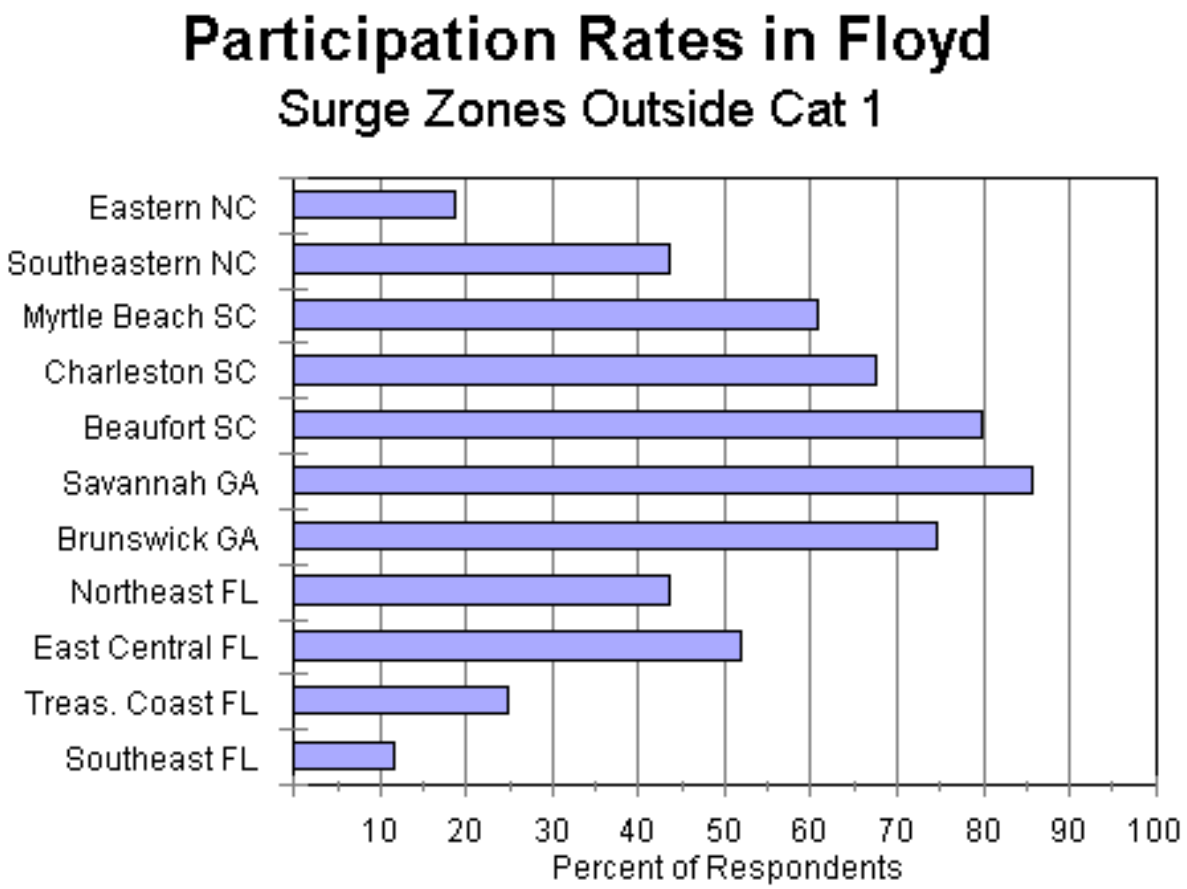
Evacuation Participation Rates

There was considerable variation in evacuation rates among the 11 survey areas (Figure's 2-5). Evacuation (i.e., leaving one's home to someplace safer) was highest in Georgia and southern South Carolina. In the category 1 zone up to 90% left from the Savannah area, and numbers were almost as high around Brunswick and Beaufort. Rates dropped off gradually both north and south, with major drop-offs for the Treasure Coast and southeast Florida and eastern North Carolina areas.

Figure 2 Participation rates in Floyd - Cat 1 Surge Zone

Evacuation was also high in Georgia and in the Beaufort, SC area for people living in areas subject to surge inundation in storms stronger than category 1, with 75% to 85% leaving from those areas. Again, the dropoff was gradual in both directions, with more significant decreases at the ends of the study area. In Florida only category 1 surge areas were ordered to evacuate. In Georgia and southern South Carolina entire coastal counties were told to evacuate.

Figure 3



In the Charleston, Beaufort, and Savannah areas evacuation from non-surge zones was unusually high. In all three areas all or most of the counties were told to evacuate. Even away from those locations between 20% and 40% of the non-surge residents left in most survey areas. These “shadow” evacuees contributed to the number of people on evacuation routes.

Evacuation in adjacent non-coastal counties was surprisingly high, averaging approximately 25%. In the Charleston vicinity almost half the residents in adjacent non-coastal counties evacuated their homes.

Figure 4

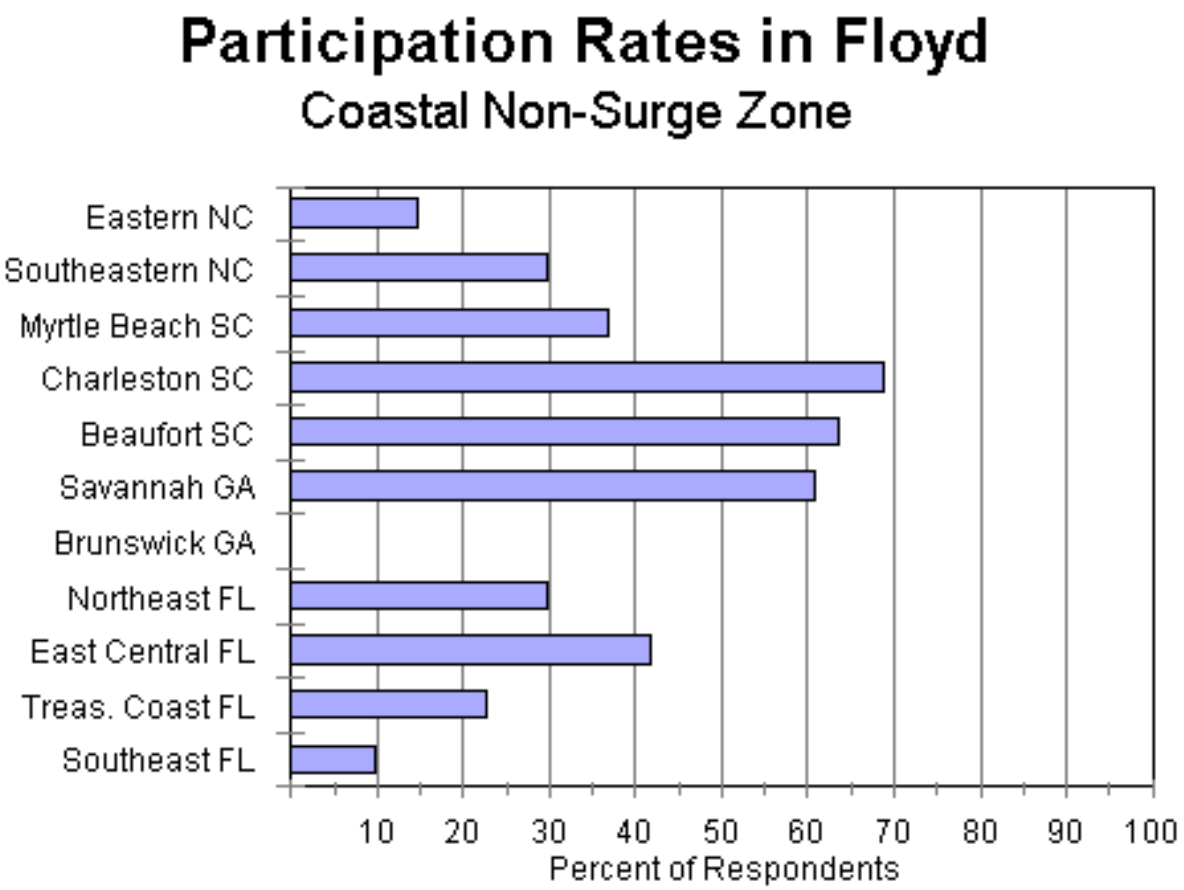
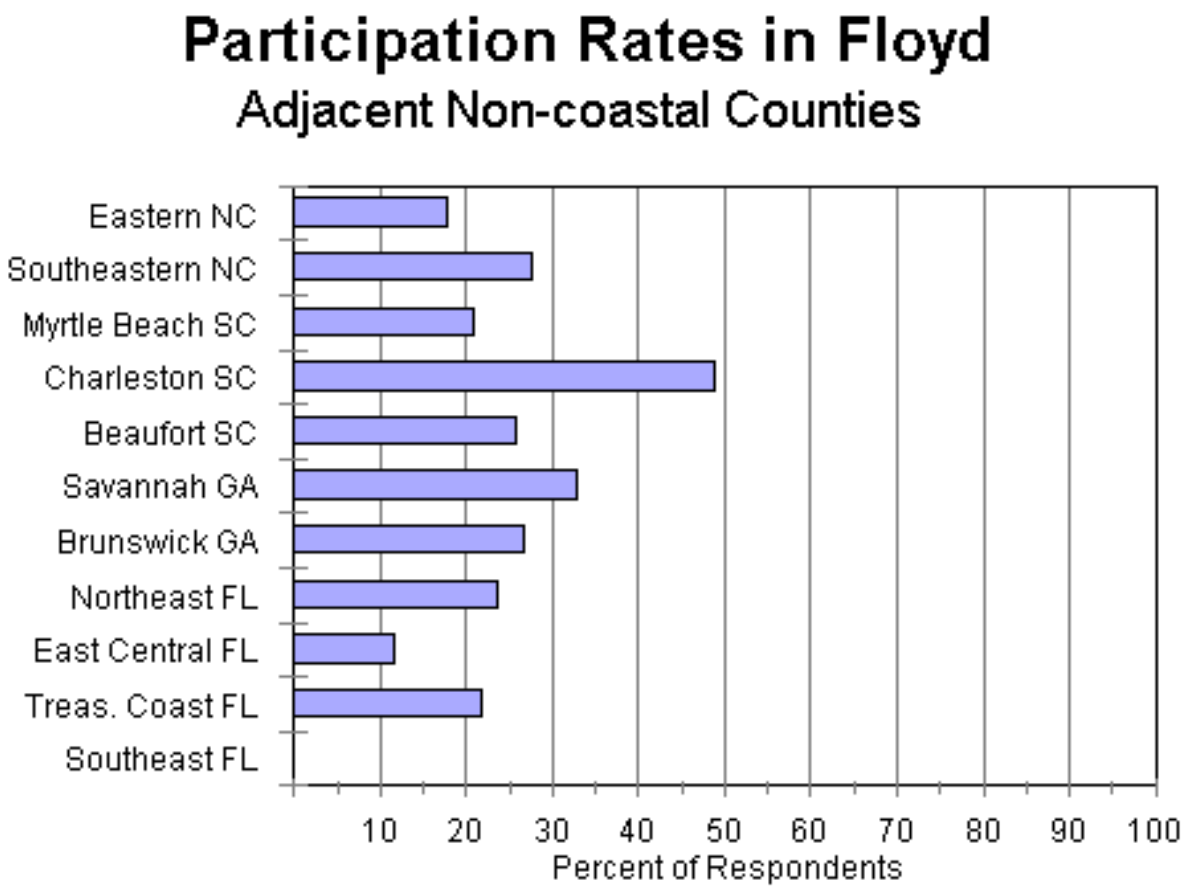
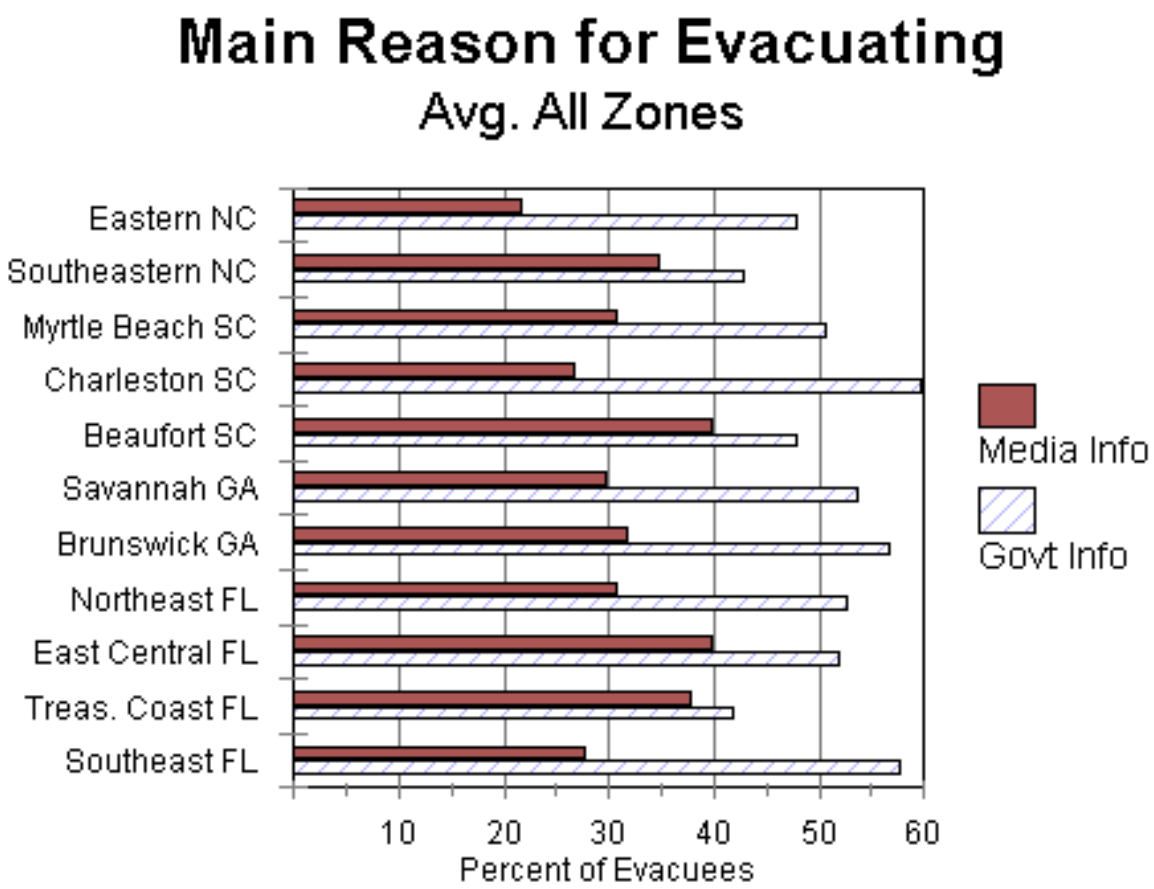

Participation Rates in Floyd
Coastal Non-Surge Zone
Eastern NC
Southeastern NC
Myrtle Beach SC
Charleston SC
Beaufort SC
Savannah GA
Brunswick GA
Northeast FL
East Central FL
Treas. Coast FL
Southeast FL
10
20
30
40
50
60
70
80
90
100
Percent of Respondents

Figure 5



Respondents who evacuated were asked why they left, and most said they left because of a combination of reasons such as evacuation notices from public officials, storm severity, and recommendations from friends, family, and the media. To sort out the effects of official information heard via the media and other kinds of information heard through the media, evacuees were asked which was the main influence on their decision to evacuate. For most people, information coming from public officials (or which they perceived to be coming from officials) had the greater effect (Figure 6).

Figure 6



Except in the two southernmost Florida locations, most people living in category 1 surge areas said they heard officials call for their evacuation (Figure 7). The highest percentage was only 80%, however, in Charleston. In surge areas beyond the category 1 risk area, only in Georgia and South Carolina did most people hear evacuation notices from officials (Figure 8).

Figure 7

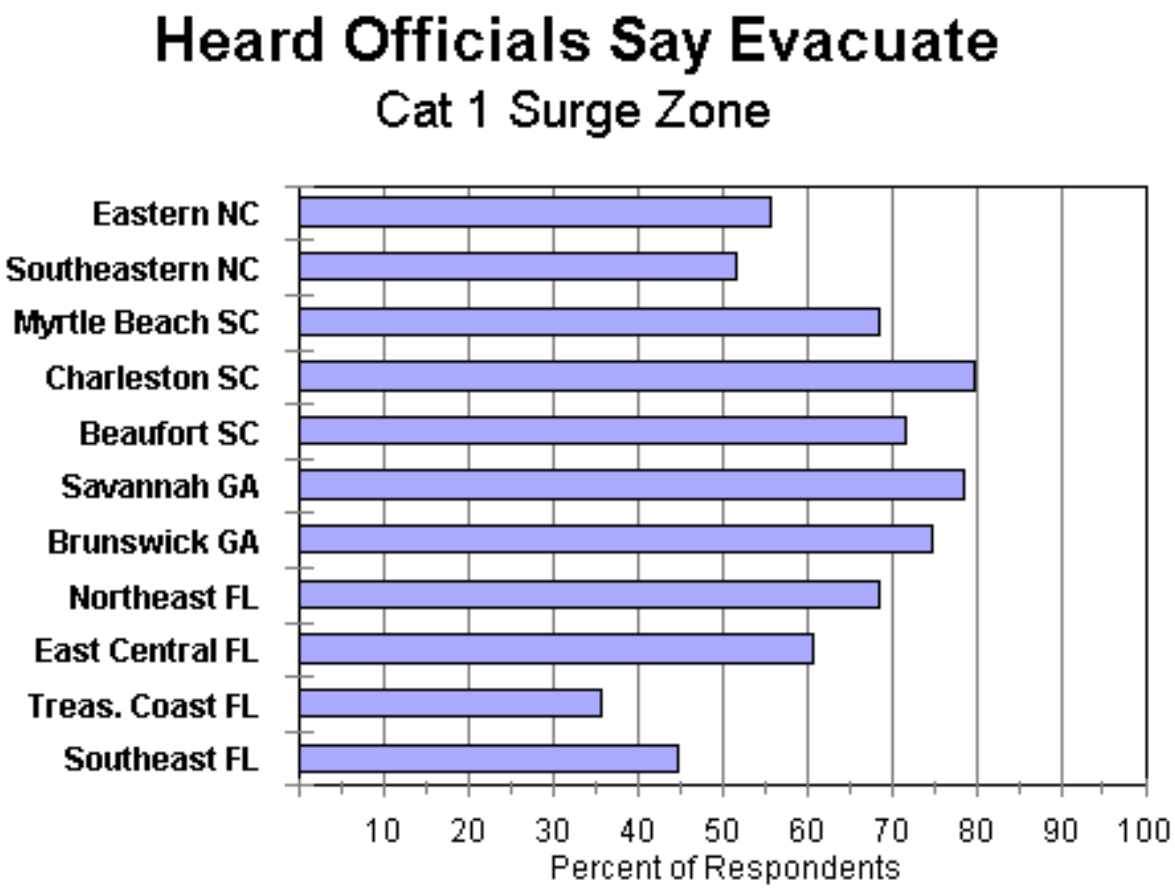
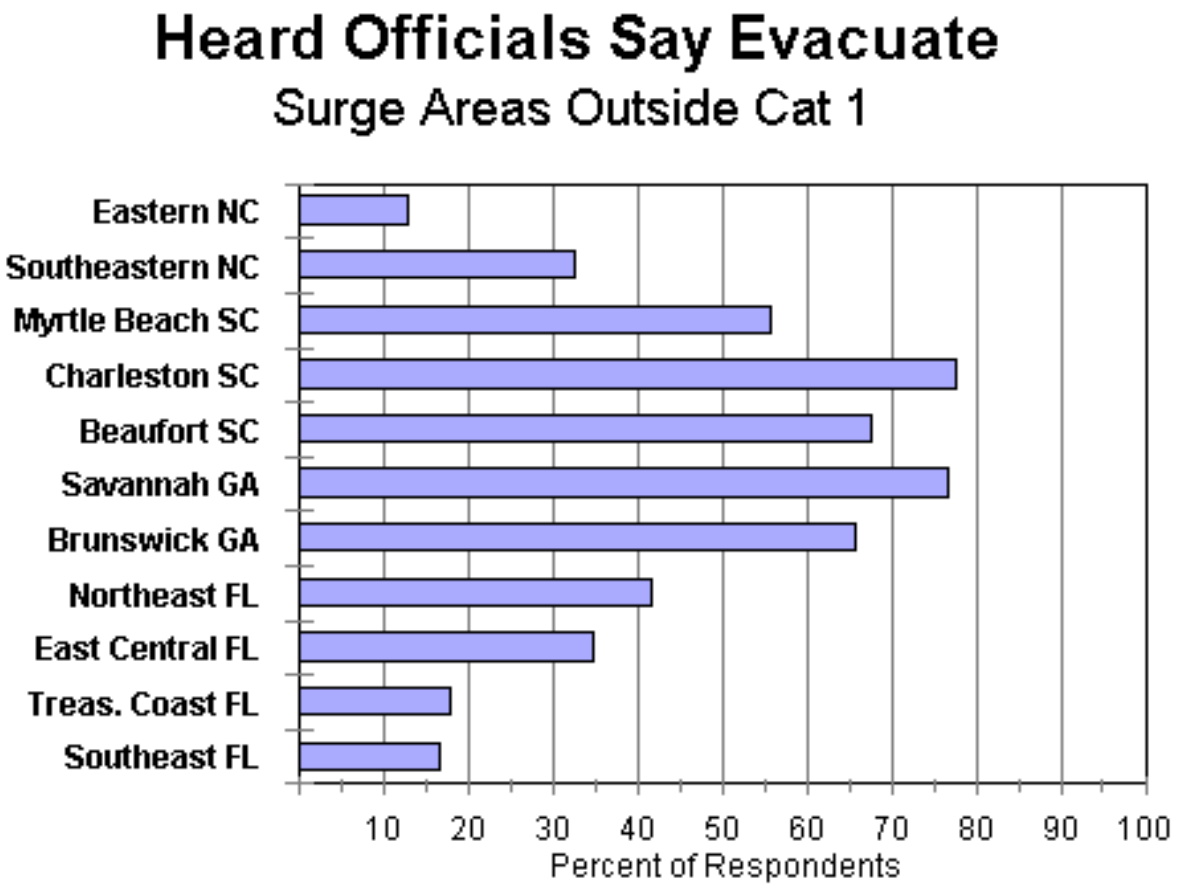
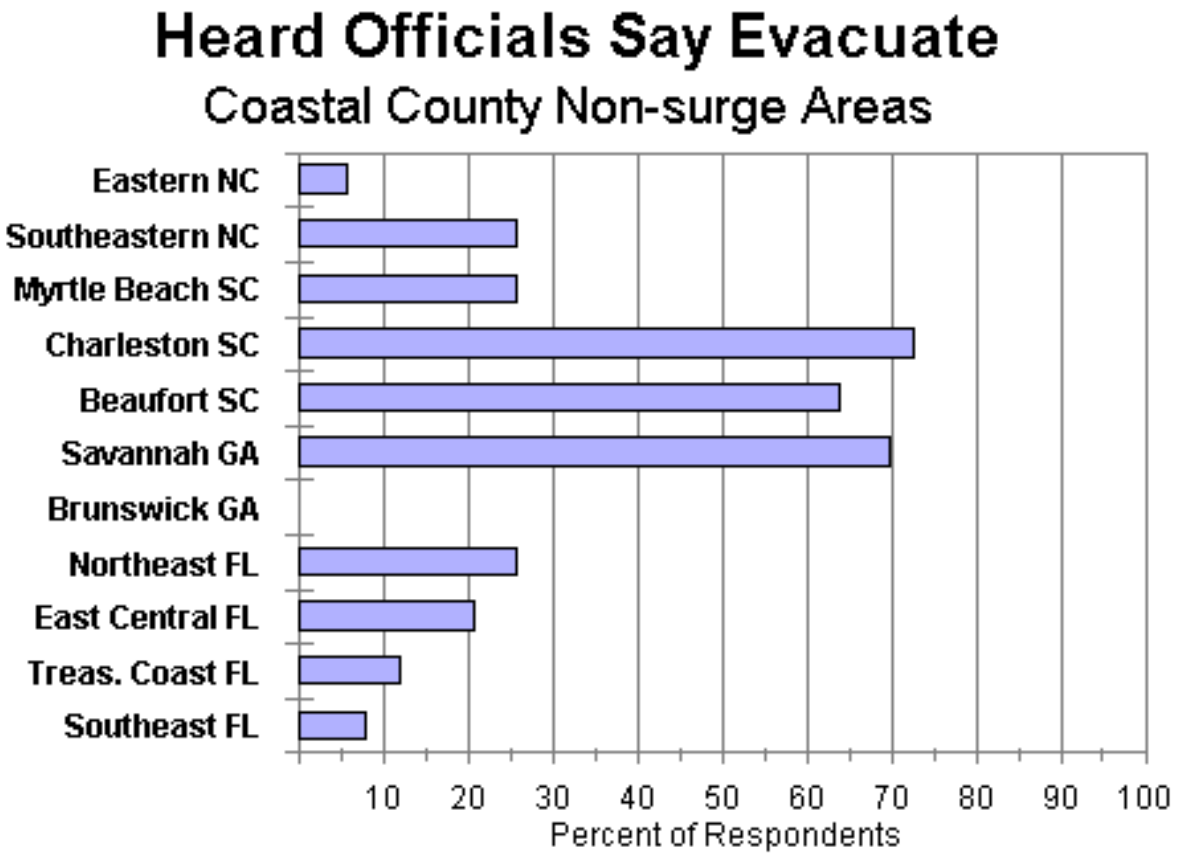

Heard Officials Say Evacuate
Cat 1 Surge Zone
Eastern NC
Southeastern NC
Myrtle Beach SC
Charleston SC
Beaufort SC
Savannah GA
Brunswick GA
Northeast FL
East Central FL
Treas. Coast FL
Southeast FL
10
20
30
40
50
60
70
80
90
100
Percent of Respondents

Figure 8



Some residents living in non-surge areas also believed they heard officials say that they should evacuate (Figure's 9-10). In Georgia and parts of South Carolina more than 60% of the non-surge residents of coastal counties said they heard official evacuation notices which applied to them, and that was probably correct for most. In other states, and in non-coastal counties, that was probably not correct, except for people living in mobile homes.

Figure 9



Hearing, or believing one heard, evacuation notices from public officials had a significant impact on whether residents evacuated (Figure 11). Within each of the four risk areas, people who said they heard mandatory evacuation orders from officials were most likely to evacuate, followed by those who said they heard officials recommend that they should leave, followed by people who said they didn't hear from officials that they should leave. It is extremely important for officials to reach those for whom evacuation notices are intended and to avoid confusing those for whom they are not intended.

Figure 10

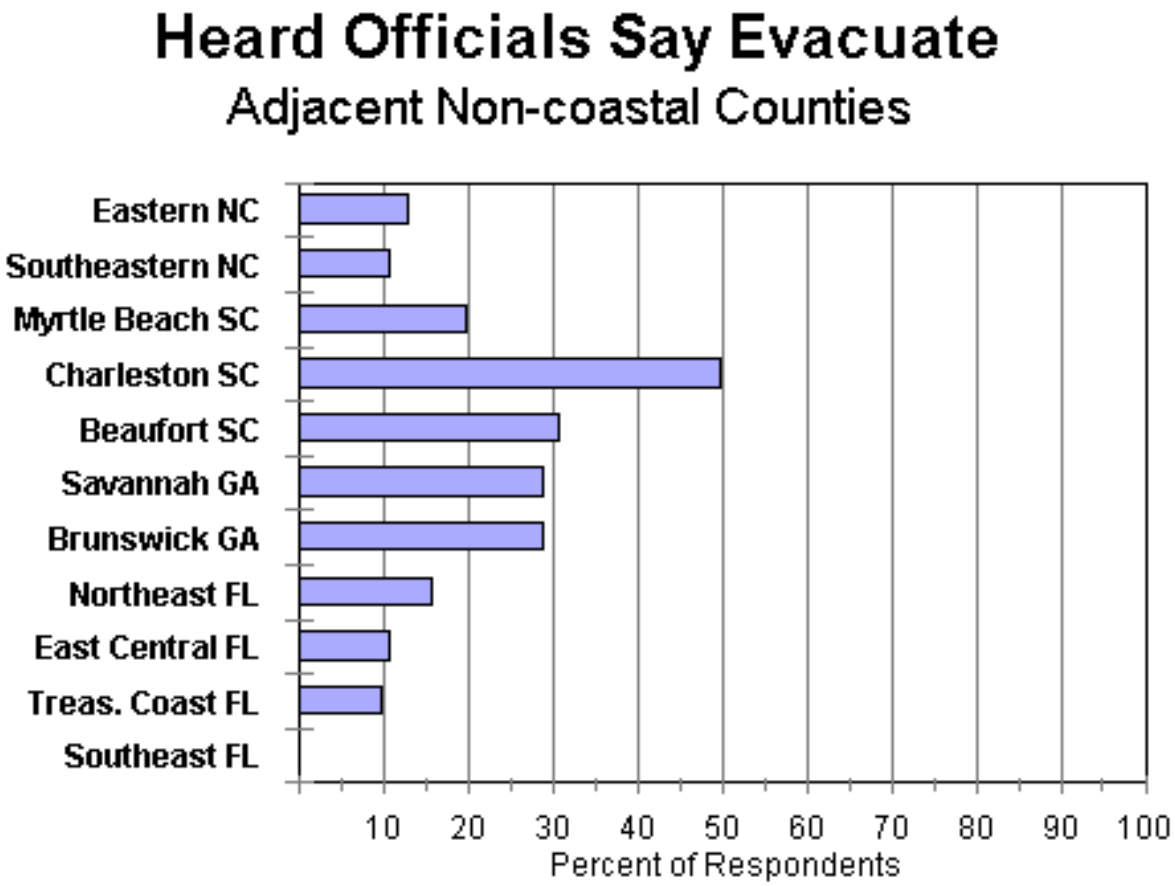
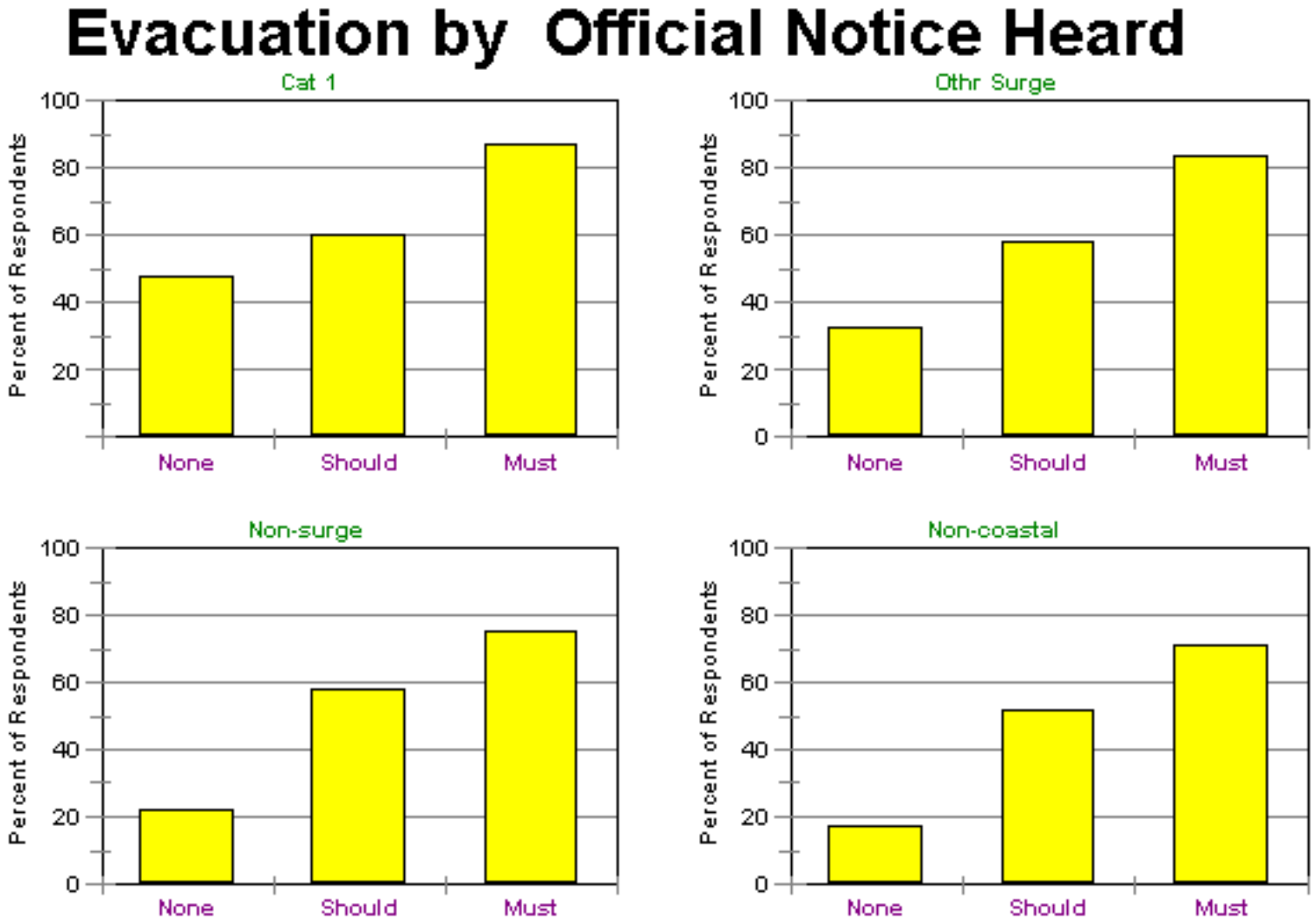

Heard Officials Say Evacuate
Adjacent Non-coastal Counties
Eastern NC
Southeastern NC
Myrtle Beach SC
Charleston SC
Beaufort SC
Savannah GA
Brunswick GA
Northeast FL
East Central FL
Treas. Coast FL
Southeast FL
10
20
30
40
50
60
70
80
90
100
Percent of Respondents

Figure 11



One reason there was substantial evacuation from areas not targeted by officials is that many residents of non-surge areas perceive themselves to be vulnerable in major hurricanes (Figure's 12-13). When asked whether their homes would be safe in a 125 MPH hurricane, 20% to 40% of the people living in coastal county non-surge areas believe their homes would be unsafe from storm surge and waves, and 25% to 60% believe their homes would be unsafe, considering both wind and water. Even in adjacent non-coastal counties 15% to 35% believe their homes would experience dangerous flooding from storm surge or waves, and 40% to nearly 60% believe their homes would be unsafe, considering both wind and water. Although some of the areas might experience inland flooding from heavy rainfall, and some people live in mobile homes or substandard construction, most are probably overestimating their vulnerability.

The importance of the perception is depicted in Figure 14. People who believe their homes are unsafe are much more likely than others in their same risk area to evacuate. In most locations people who believe their homes are unsafe are about twice as likely as others to leave. This is a good thing when applied to people who really need to evacuate, but it can contribute to overcrowding on evacuation routes and in shelters when applied to people who could stay home and be safe.

There are various ways to reach the public with evacuation and vulnerability information during a hurricane threat, but local television and The Weather Channel are the most-relied upon sources of information in most locations (Figure 15). Eventually the Internet and online

computer services will gain increased importance, but currently less than 10% of coastal residents say they rely heavily on those sources for hurricane information during a threat.

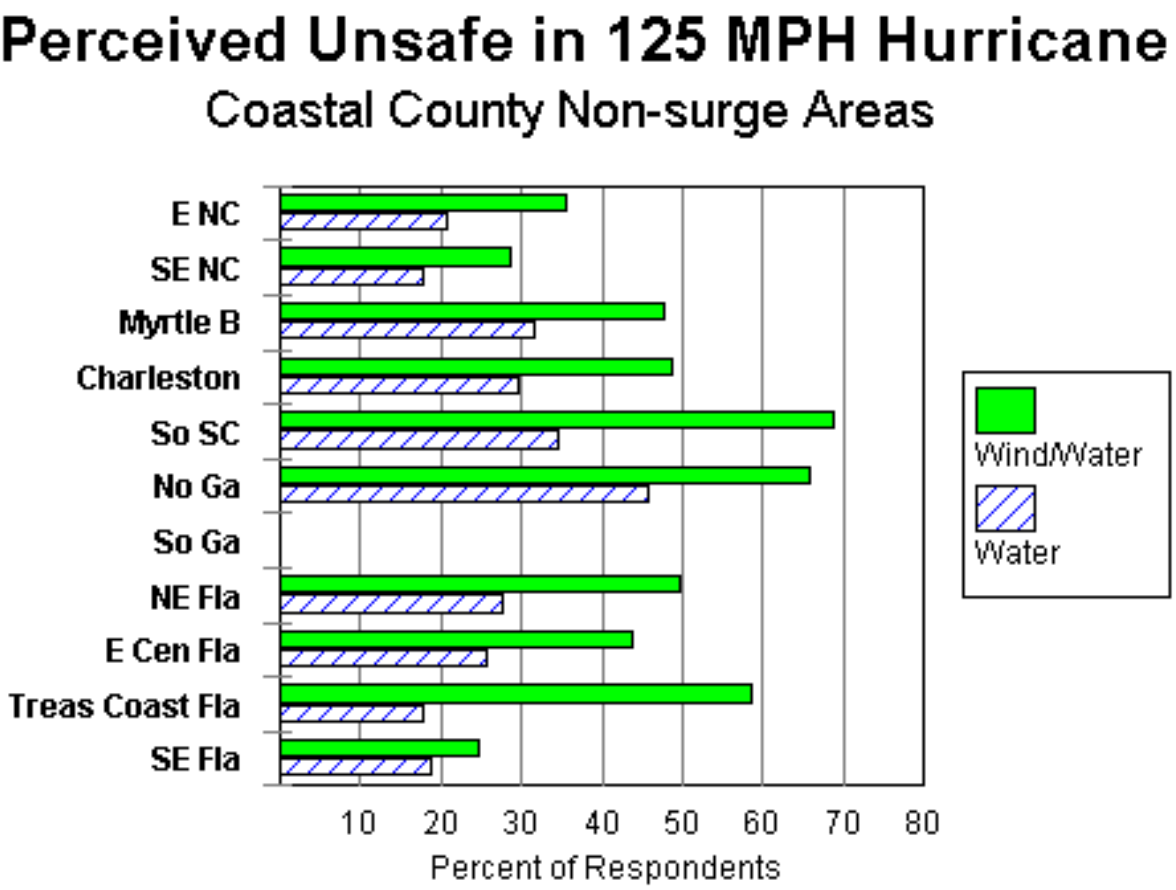


Figure 13

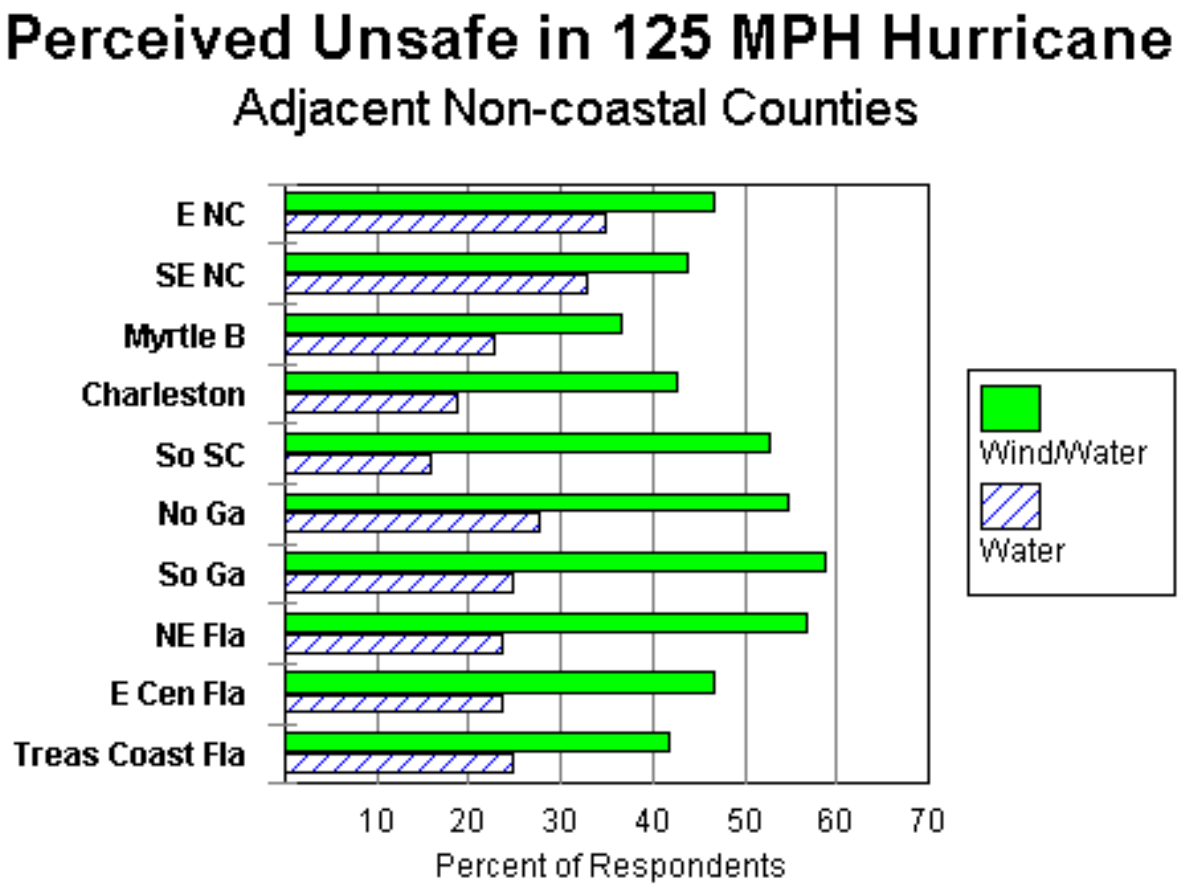

Perceived Unsafe in 125 MPH Hurricane
Adjacent Non-coastal Counties
E NC
SE NC
Myrtle B
Charleston
So SC
No Ga
So Ga
NE Fla
E Cen Fla
Treas Coast Fla
10
20
30
40
50
60
70
Percent of Respondents
Wind/Water
Water

Figure 14

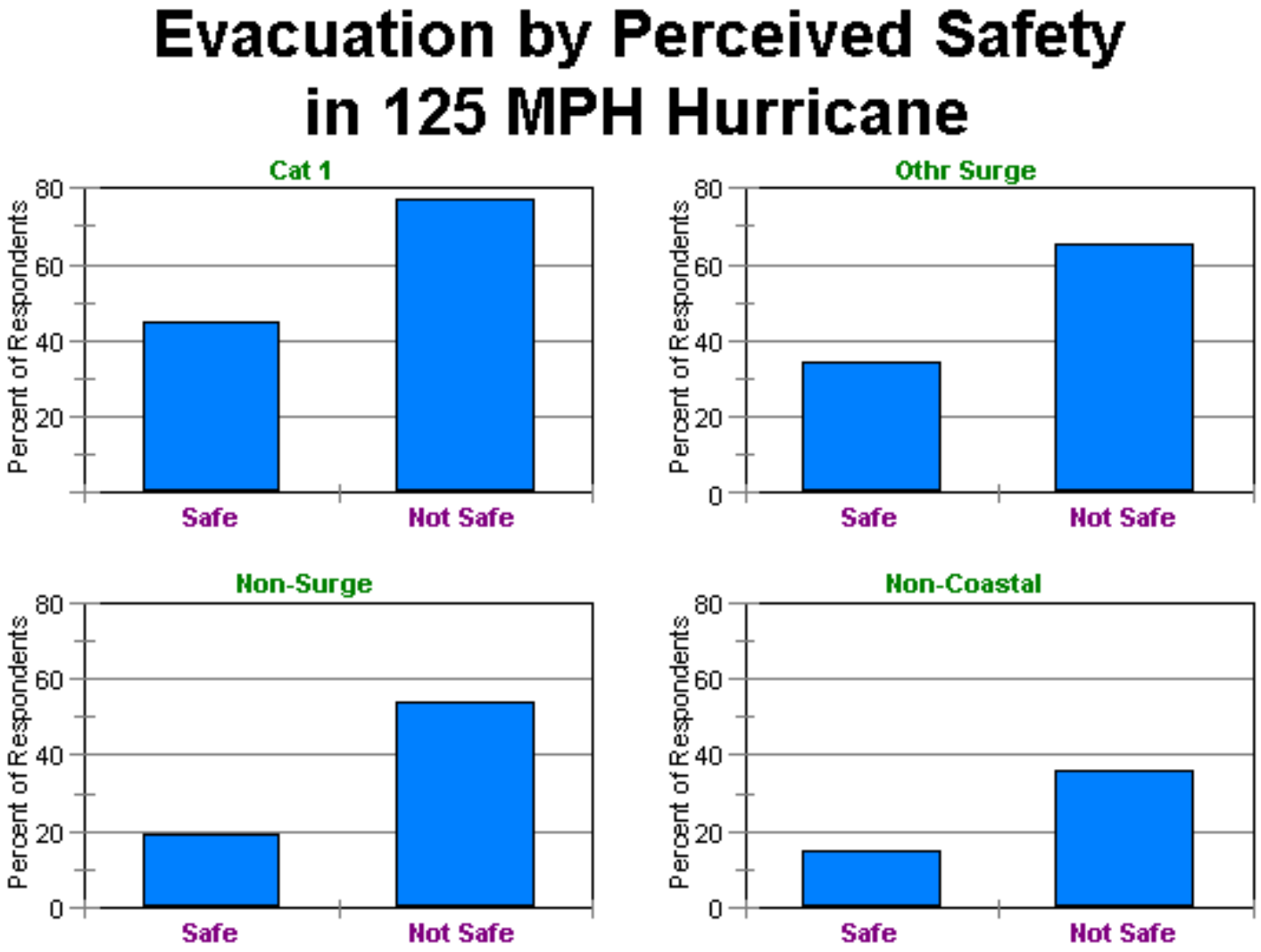
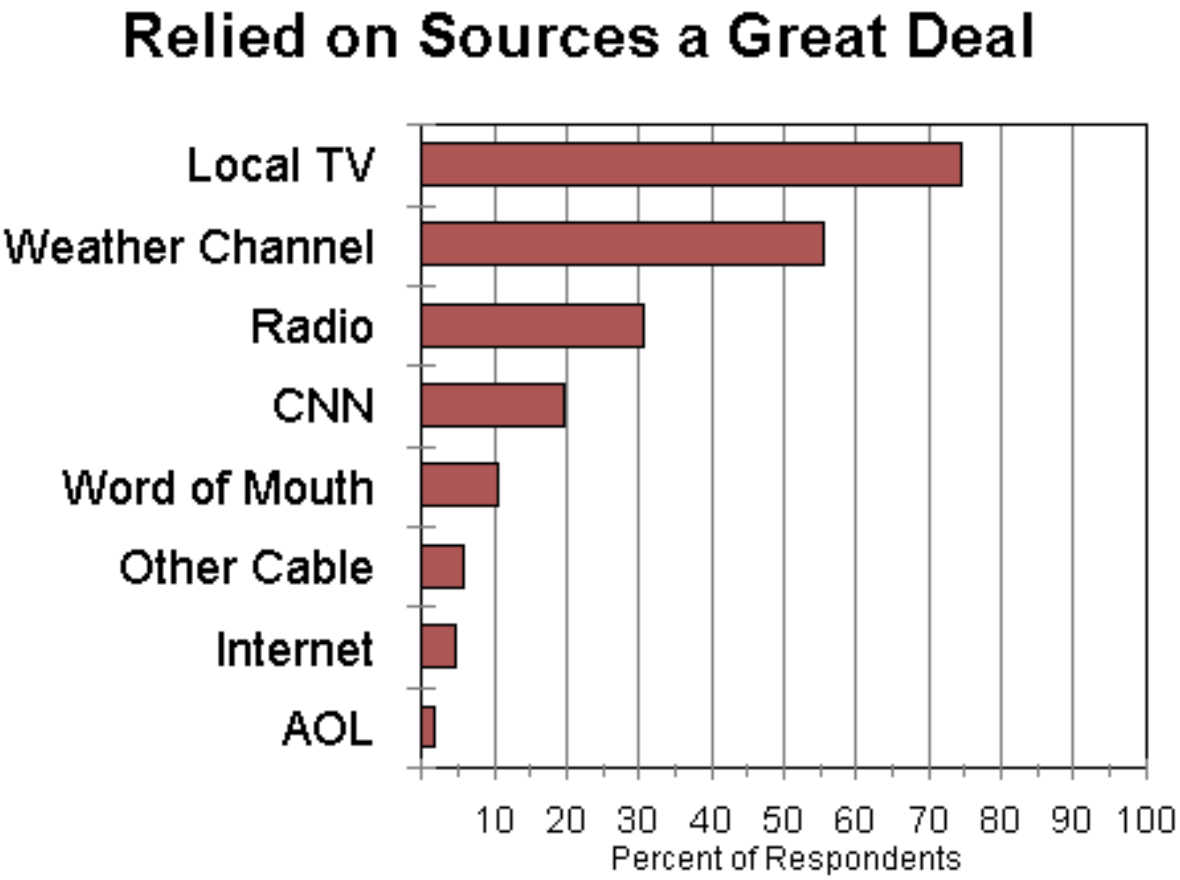

Evacuation by Perceived Safety
in 125 MPH Hurricane
Cat 1
Othr Surge
Non-Surge
Non-Coastal
Percent of Respondents
0
20
40
60
80
Safe
Not Safe

Figure 15



Evacuation Destinations

As indicated earlier, evacuation refers to leaving one's home to go someplace else. The new place can be across town or in a different state. Evacuation congestion is made worse when large numbers of evacuees leave the local area rather than simply going to safe locations within their own community.

In Floyd an unusual percentage of evacuees went to destinations outside their own county (Figure's 16-19). Among evacuees from category 1 and larger surge zones, as many as 98% left their own county, and in eight of the eleven study locations more than 70% did so. These percentages are unusually high, but even in non-surge areas more than half the evacuees went out-of-county in eight of the ten non-surge locations (there was no sample of non-surge residents in the south Georgia area). In adjacent non-coastal counties more than half the evacuees went out of county from half the survey sites.

Evacuees who went to locations outside their own county were asked why they did so. In some places the answer was obvious. Georgia and some South Carolina locations evacuated entire coastal counties, so there were no places to go within those counties and still comply with evacuation notices. Moreover, in those locations residents appear to appreciate the vulnerability of their counties. In many locations public shelters are not operated in coastal counties or even in the next tier of counties inland.

Respondents gave three predominant explanations for going out of county: 1) that was the location of friends or relatives with whom they could stay, 2) the storm was strong enough so they wanted to get far away from it, and 3) they had to go as far as they did to find vacant lodging.

Respondents were asked whether their decision to go out of county was mainly influenced by information they were hearing from public officials via the media, other information from the media, or information from friends and relatives. Influences varied among locations, but in most places information from public officials had a greater influence than other messages heard through the media or from friends and relatives.

Figure 16

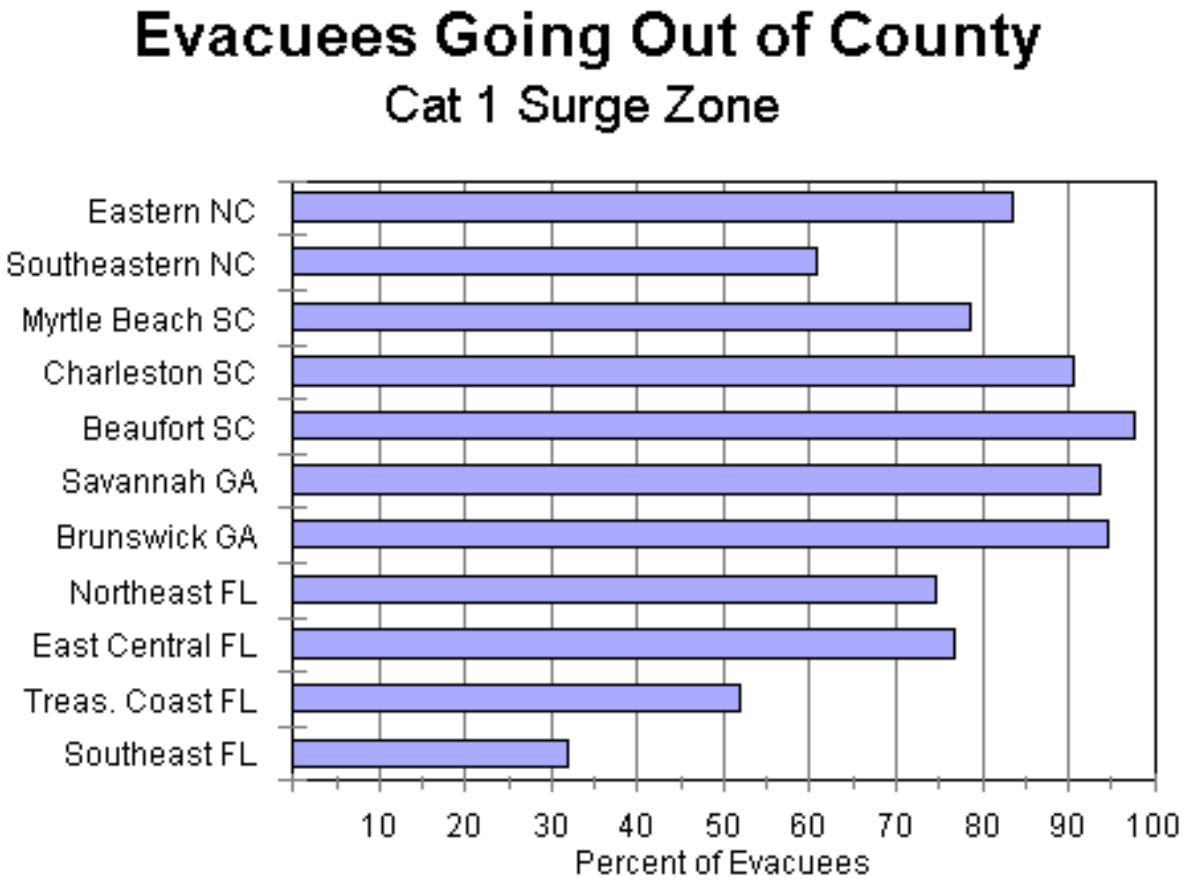


Figure 17

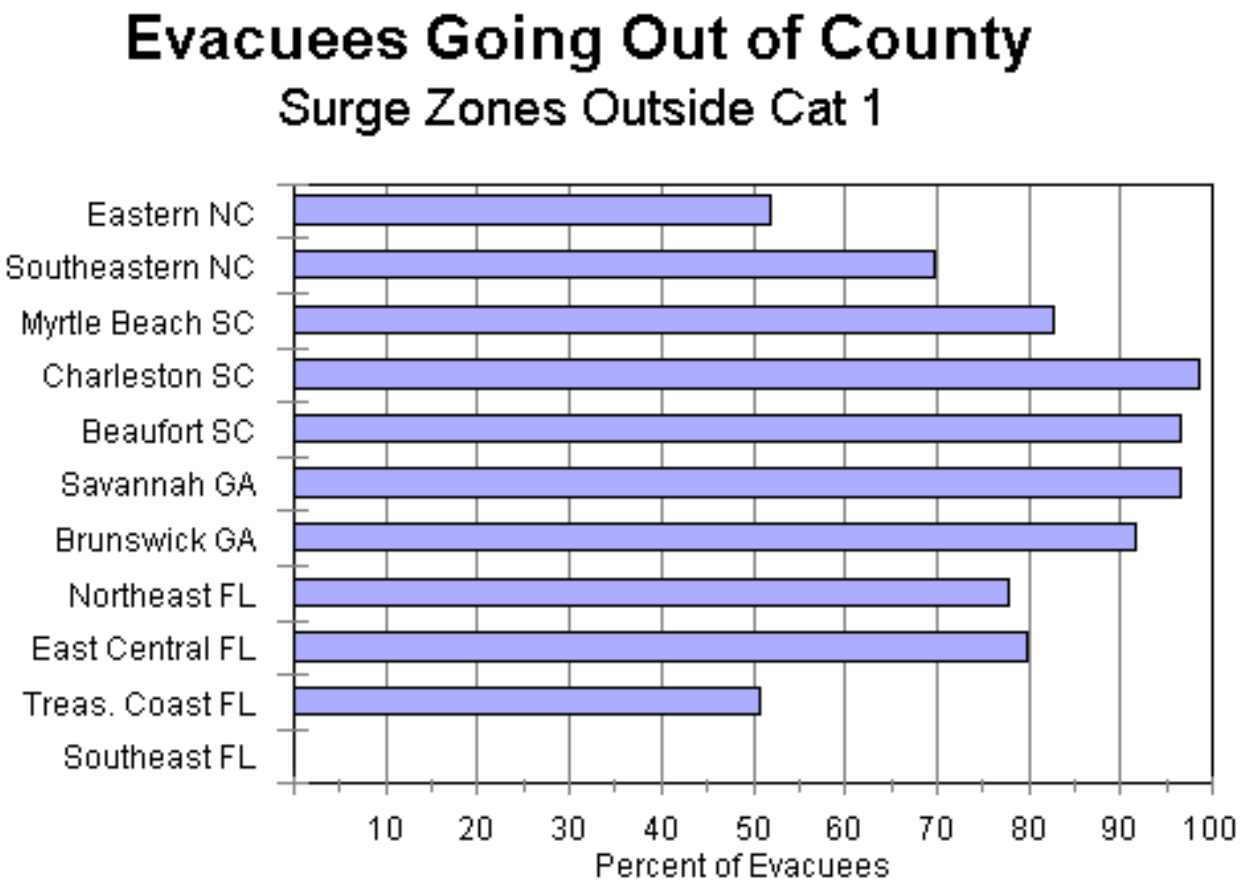

Evacuees Going Out of County
Surge Zones Outside Cat 1
Eastern NC
Southeastern NC
Myrtle Beach SC
Charleston SC
Beaufort SC
Savannah GA
Brunswick GA
Northeast FL
East Central FL
Treas. Coast FL
Southeast FL
10
20
30
40
50
60
70
80
90
100
Percent of Evacuees

Figure 18

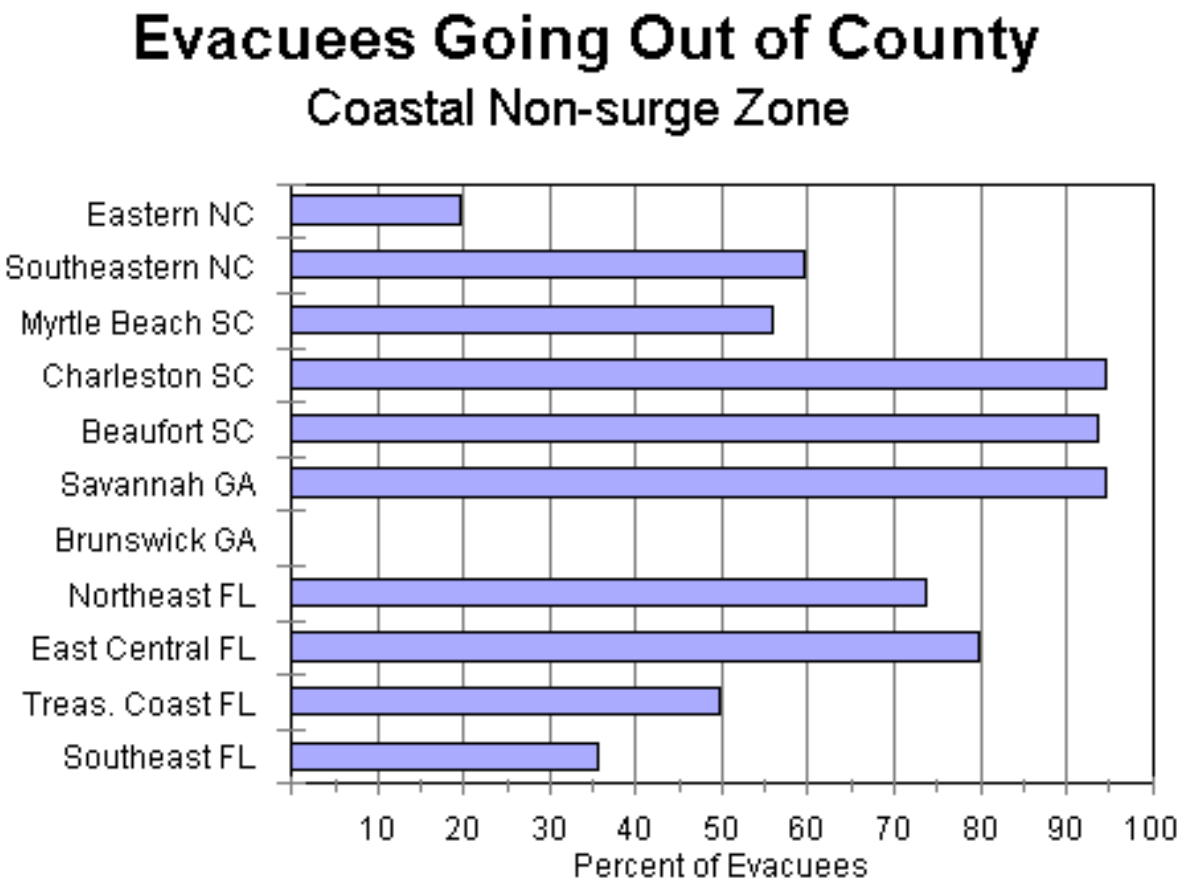
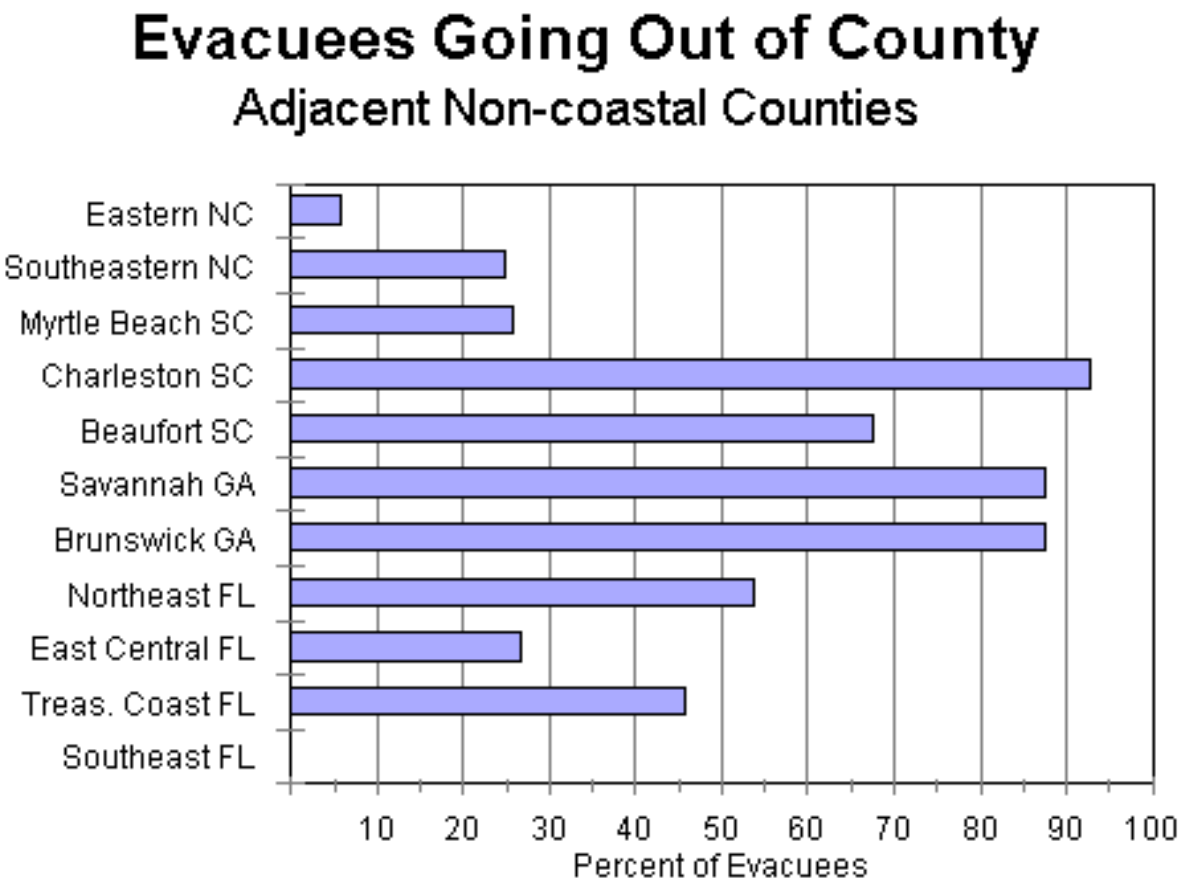

Evacuees Going Out of County
Coastal Non-surge Zone
Eastern NC
Southeastern NC
Myrtle Beach SC
Charleston SC
Beaufort SC
Savannah GA
Brunswick GA
Northeast FL
East Central FL
Treas. Coast FL
Southeast FL
10
20
30
40
50
60
70
80
90
100
Percent of Evacuees

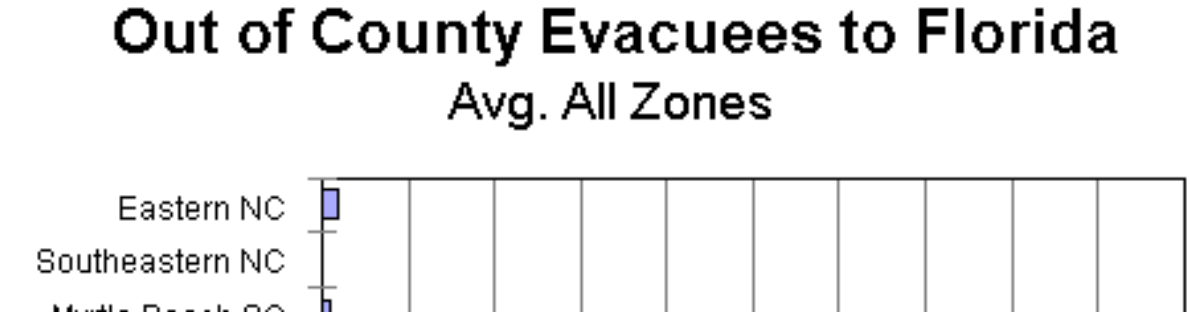
Figure 19



Between 85% and 90% of the evacuees said they reached their original destinations. Of those who changed plans roughly equal numbers went farther from home and closer to home than planned. Those going farther mainly did so looking for vacant lodging. Those who went less far did so mainly because of fatigue.

Few evacuees from other states went to Florida, which is understandable, given the track of the storm (Figure 20). Georgia, however, received visitors from both Florida and South Carolina (Figure 21). Thirty percent of the Northeast Florida evacuees went to destinations in Georgia, and 40% of those leaving Beaufort, SC went into Georgia. Few people from out of state went to South Carolina, and most evacuees from South Carolina went out of state (Figure 22). North Carolina received 14% of the Beaufort evacuees, 25% of those leaving Charleston, and 33% of those from Myrtle Beach (Figure 23).

Figure 20



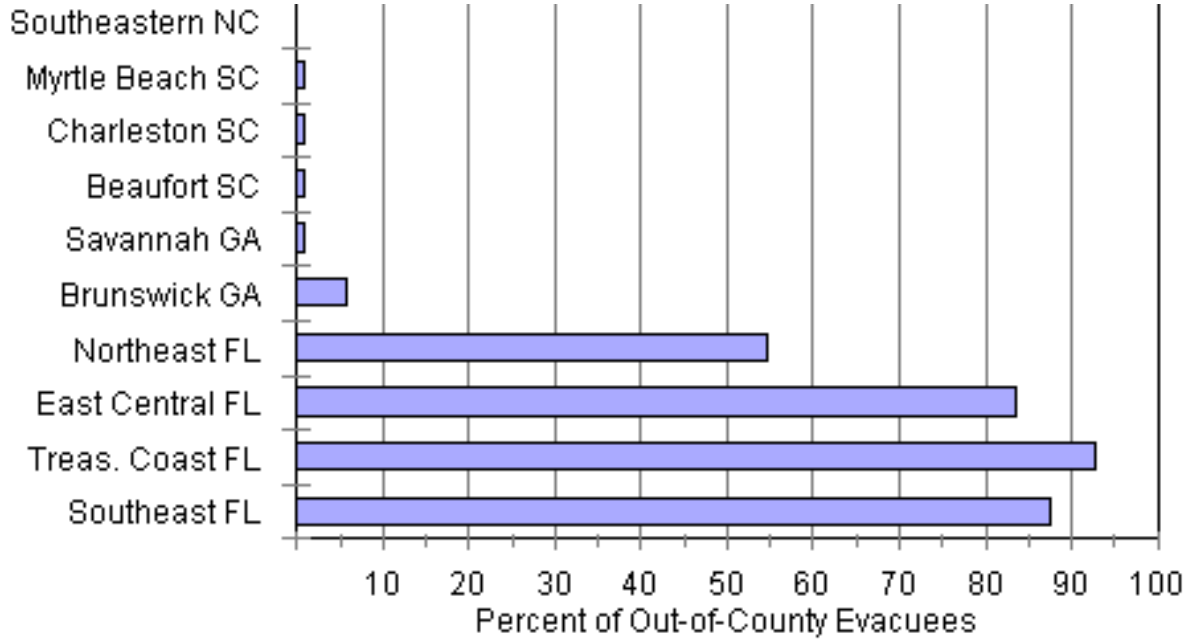


Figure 21

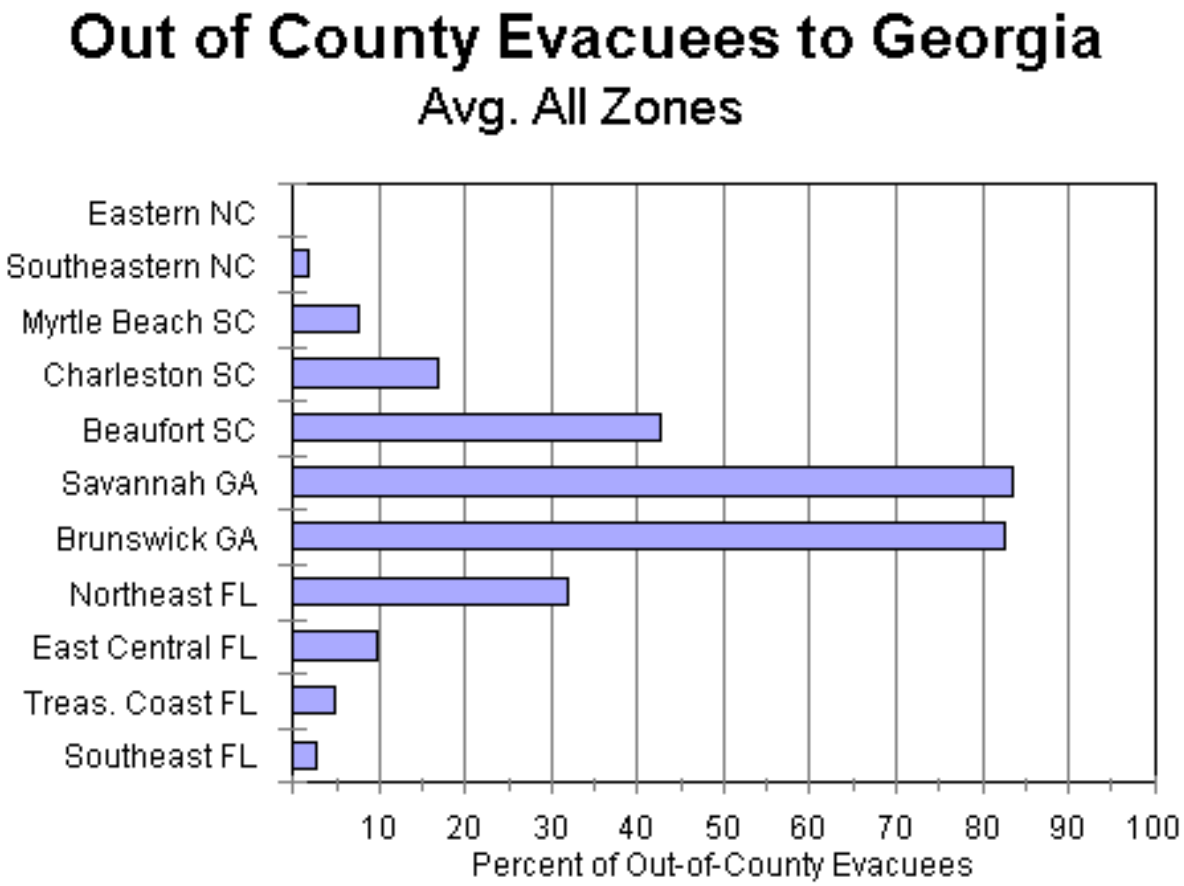


Figure 22

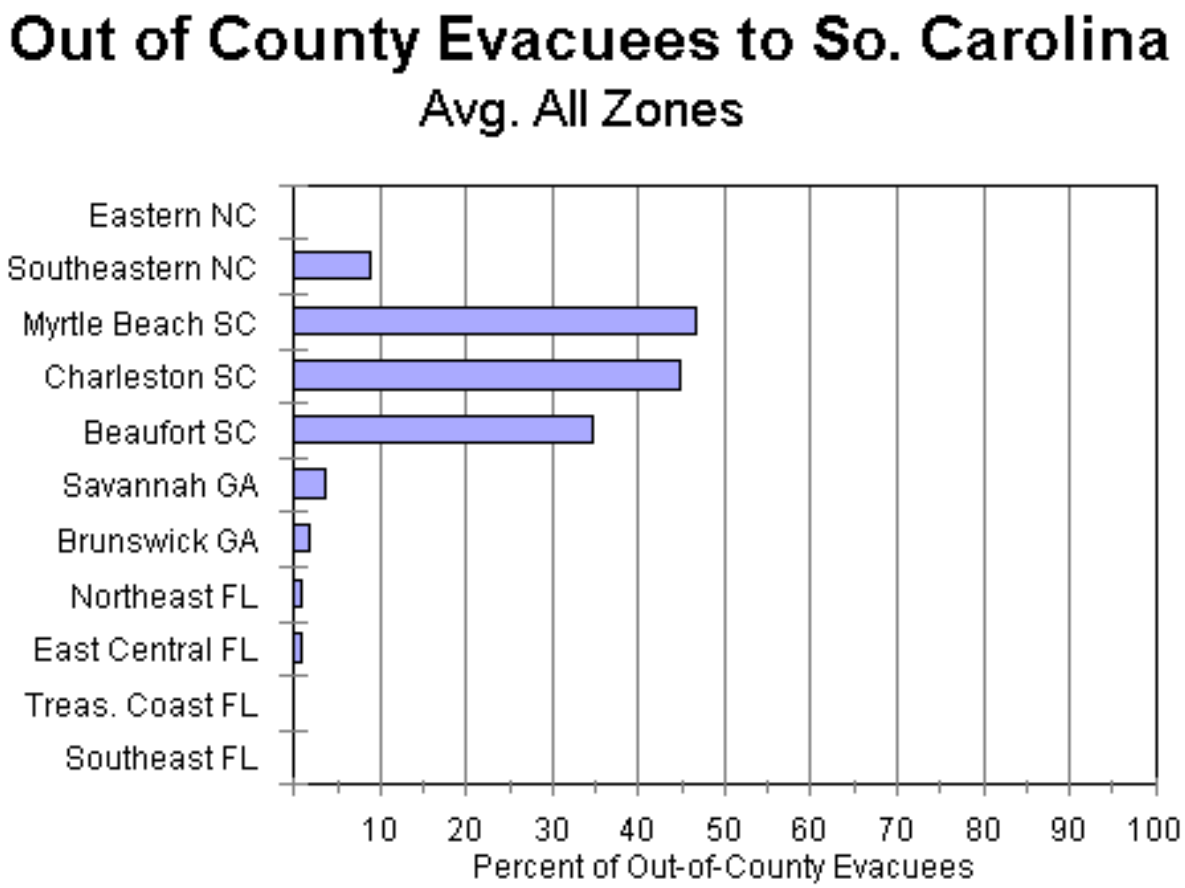
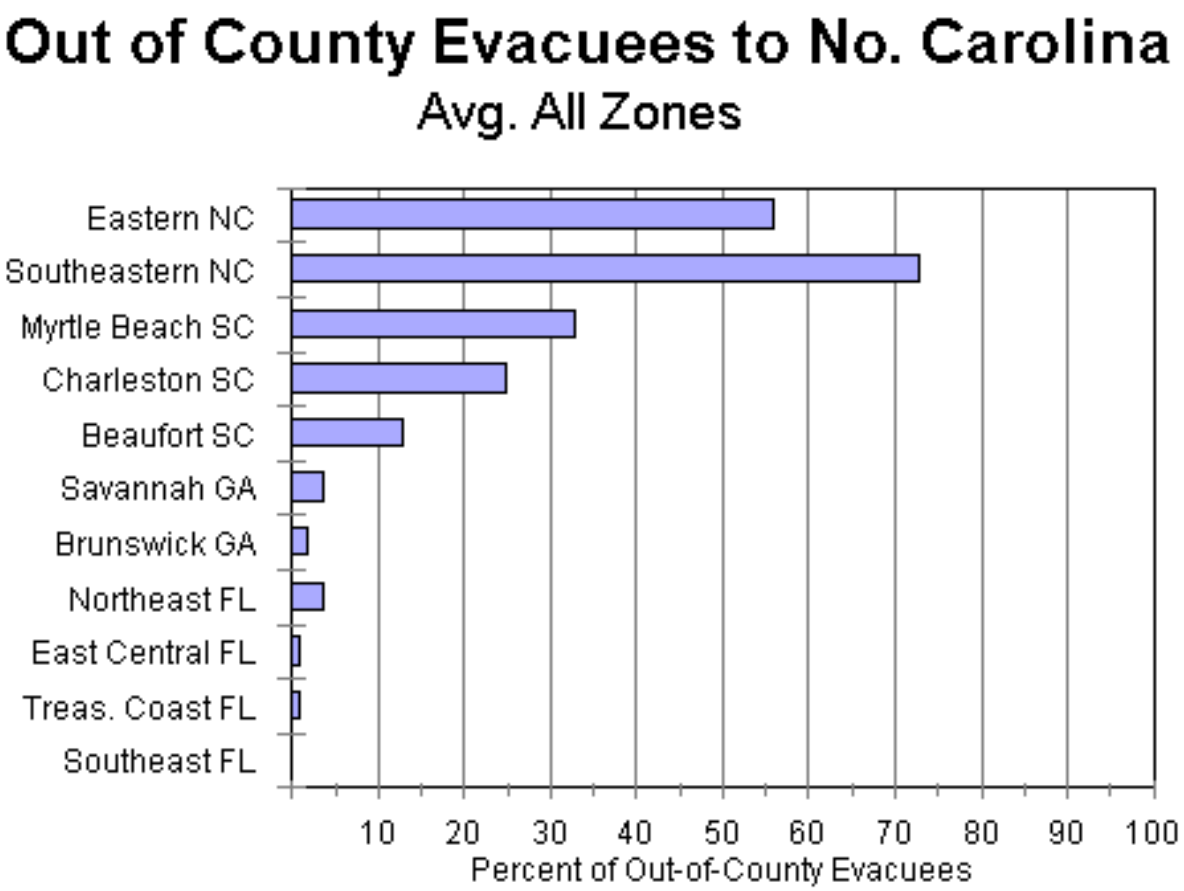

Out of County Evacuees to So. Carolina
Avg. All Zones
Eastern NC
Southeastern NC
Myrtle Beach SC
Charleston SC
Beaufort SC
Savannah GA
Brunswick GA
Northeast FL
East Central FL
Treas. Coast FL
Southeast FL
10
20
30
40
50
60
70
80
90
100
Percent of Out-of-County Evacuees

Figure 23



The majority of evacuees went to the homes of friends and relatives, which is common in most evacuations (Figure 24). Between 20% and 30% in most locations went to hotels and motels (Figure 25), and fewer than 10% (closer to 5% in most locations) went to public shelters (Figure 26). The remainder went to a variety of places such as their place of work, second homes, and churches.

Approximately 40% of the evacuees said they heard announcements concerning the availability of shelters or refuges after they left home, but fewer than 10% of those who heard took advantage of the offers.

Figure 24

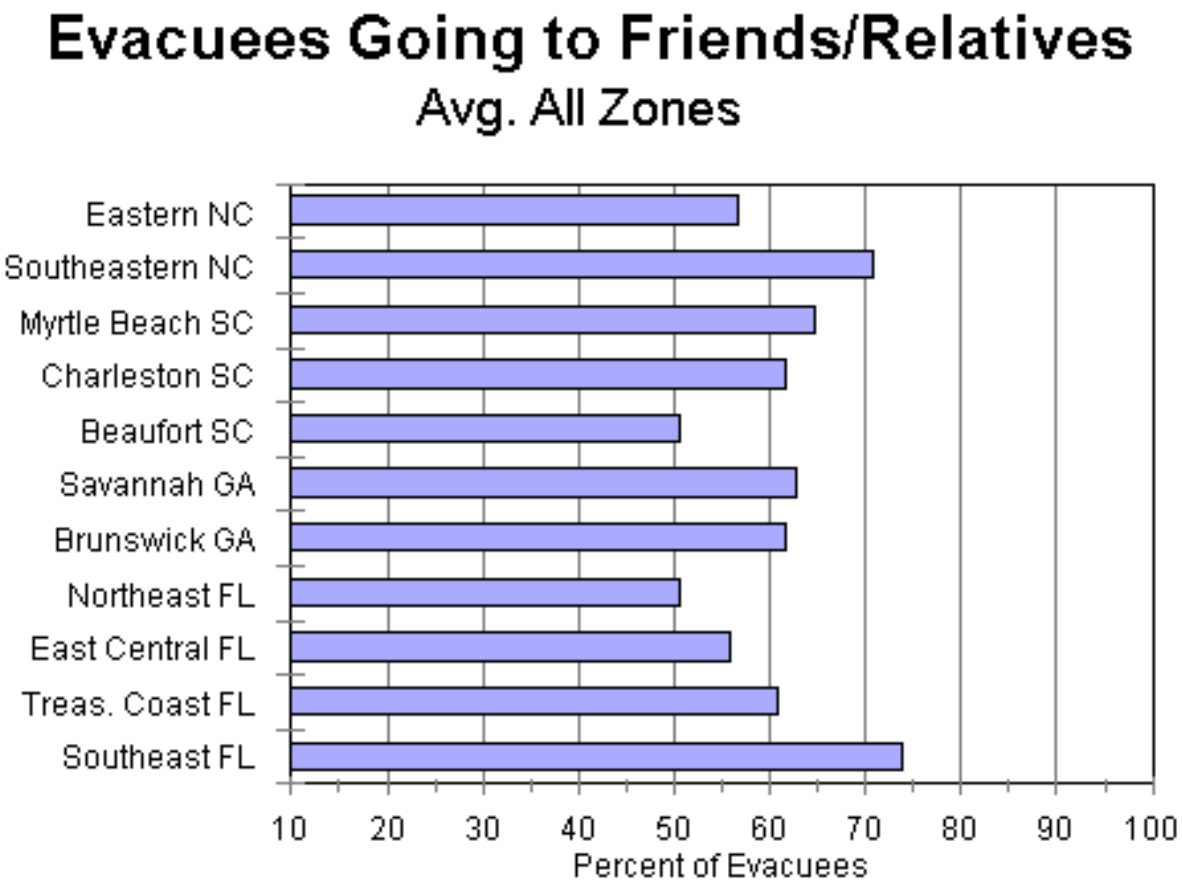

Evacuees Going to Friends/Relatives
Avg. All Zones
Eastern NC
Southeastern NC
Myrtle Beach SC
Charleston SC
Beaufort SC
Savannah GA
Brunswick GA
Northeast FL
East Central FL
Treas. Coast FL
Southeast FL
10
20
30
40
50
60
70
80
90
100
Percent of Evacuees

Figure 25

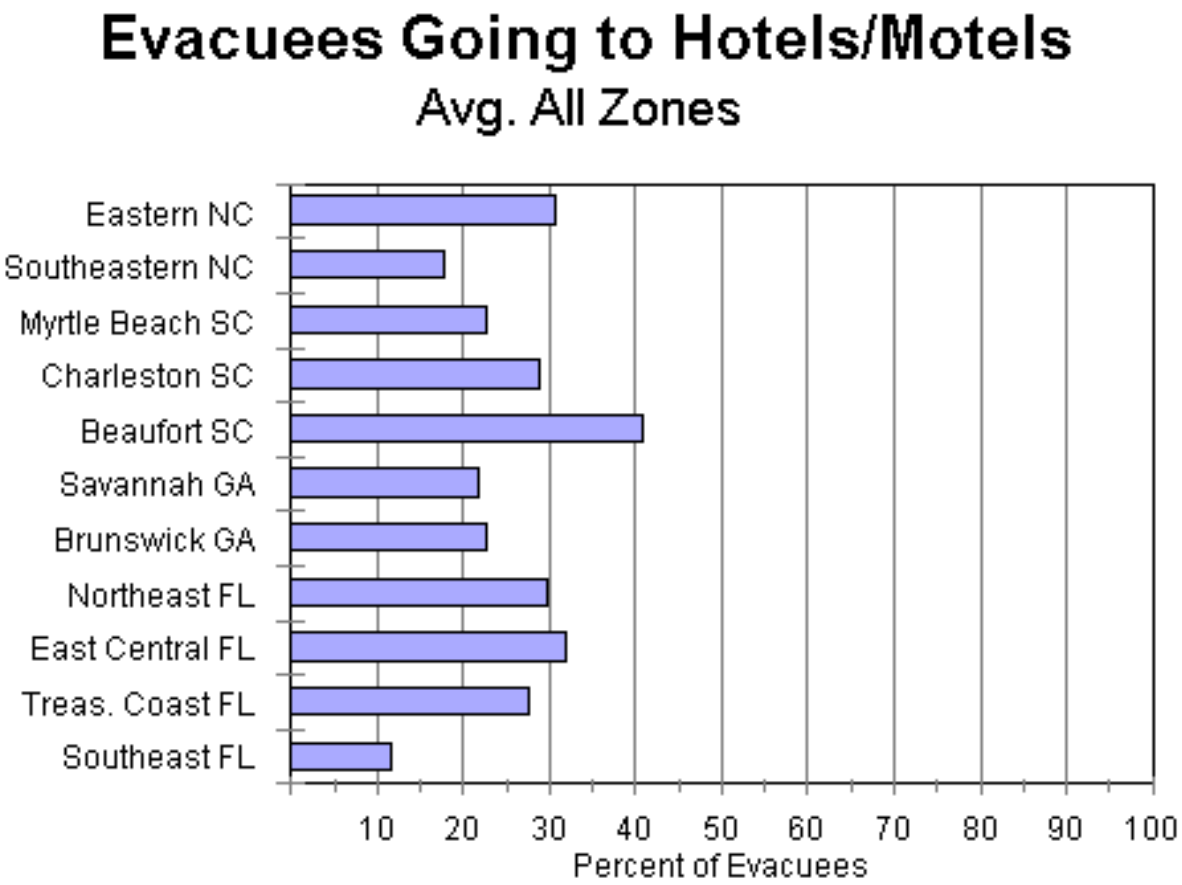
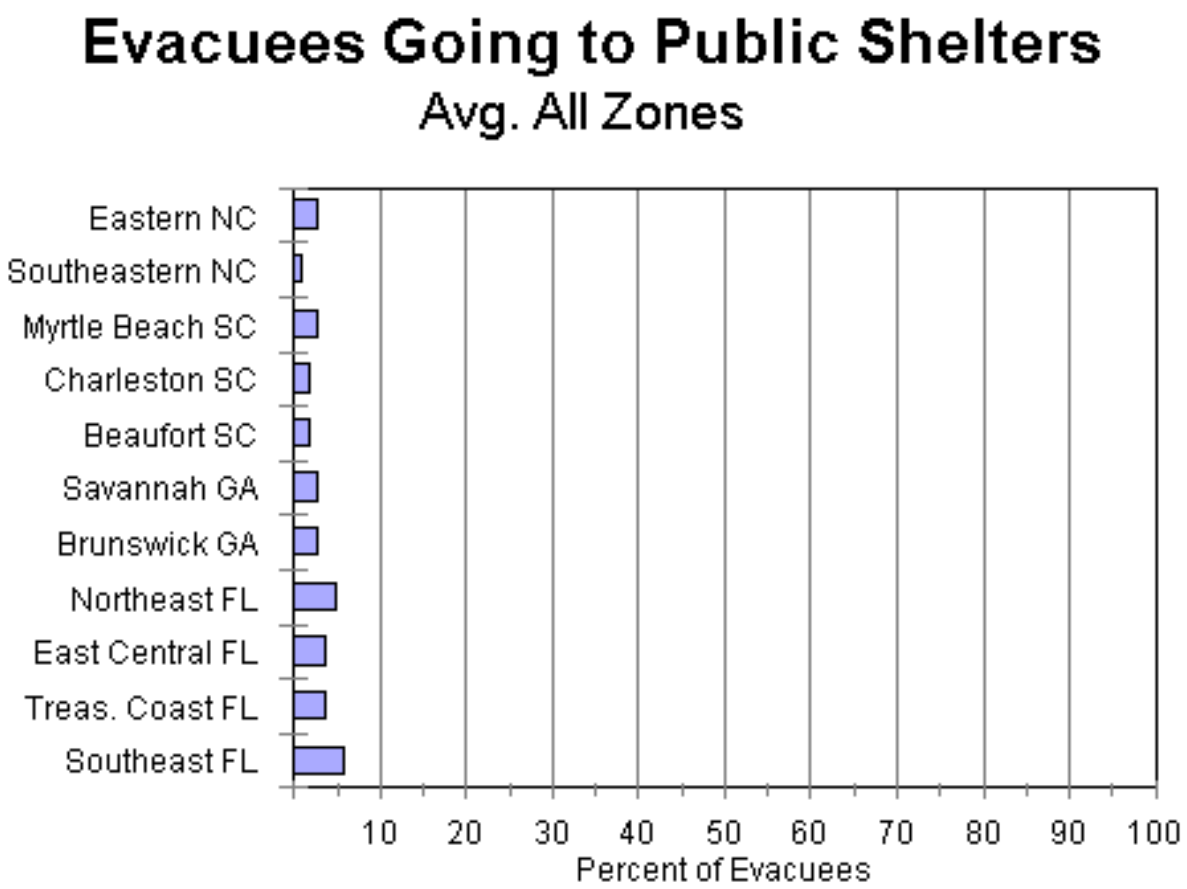

Evacuees Going to Hotels/Motels
Avg. All Zones
Eastern NC
Southeastern NC
Myrtle Beach SC
Charleston SC
Beaufort SC
Savannah GA
Brunswick GA
Northeast FL
East Central FL
Treas. Coast FL
Southeast FL
10
20
30
40
50
60
70
80
90
100
Percent of Evacuees

Figure 26



Transportation

Of all the vehicles available to evacuating households, between 65% and 75% were used in Floyd (Figure 27). The statistic is typical of most evacuations.

Evacuees in Charleston had the longest average travel times -- almost nine hours (Figure 28). Beaufort and the two Georgia sites also had average travel times exceeding six hours. Respondents were also asked how long they had expected the evacuation to take, and not surprisingly, expectations were shorter than reality (Figure 29). In Charleston more than half of the evacuees said the evacuation took more than five hours longer than they expected, and in Beaufort and the Georgia locations almost half gave that response.

When asked the reasons for traffic delays, most respondents blamed the large volume of traffic and too many people leaving at the same time. In most locations fewer than 30% attributed the delays to poor management. The exception was Charleston, where over 40% gave that explanation. Some people mentioned the need to reverse lane evacuation routes.

Evacuees were asked whether they would be willing to delay their departure in an evacuation to let people in areas of greater risk leave first, in order to avoid congestion. Between 80% and 90% said they would (Figure 30). Whether quite so many actually would cooperate in that manner, the responses do demonstrate a significant receptivity to the argument if officials are able to make it with conviction.

Figure 27

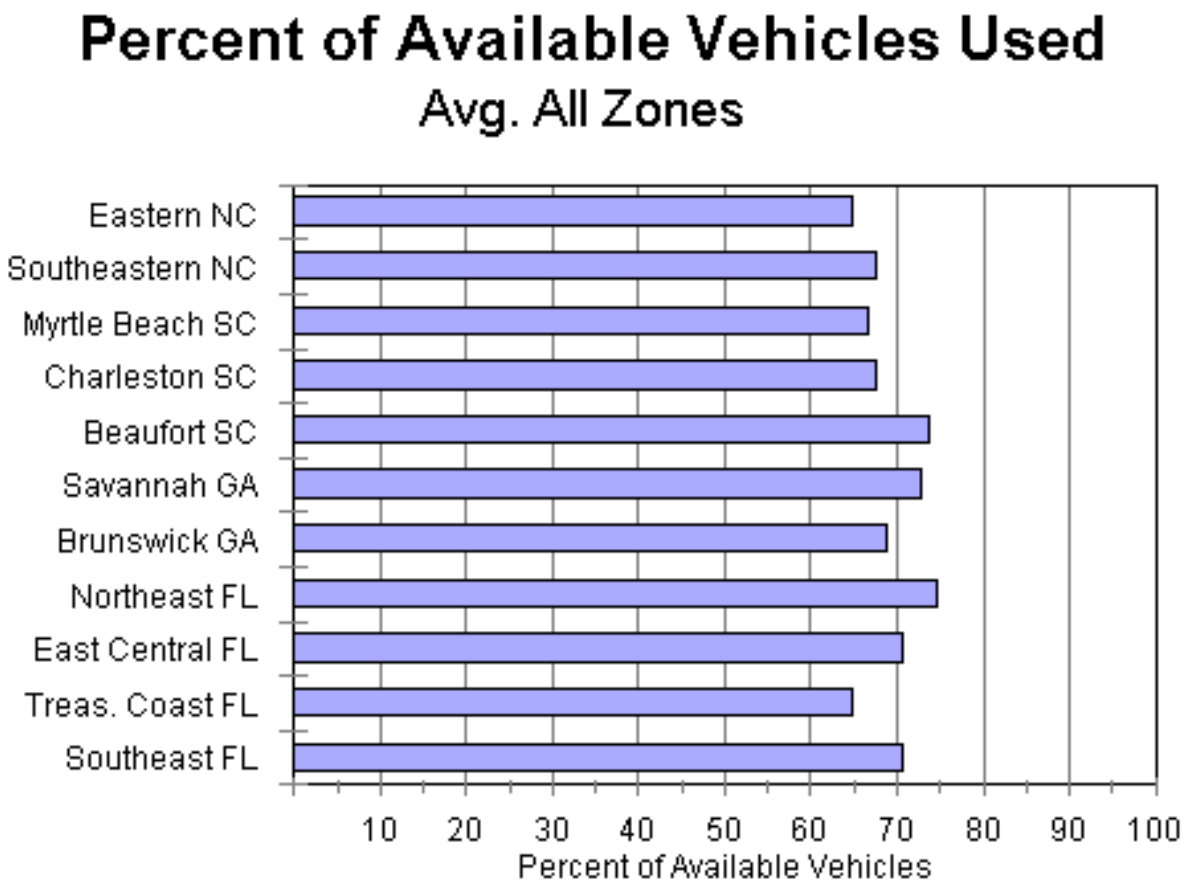


Fig 28

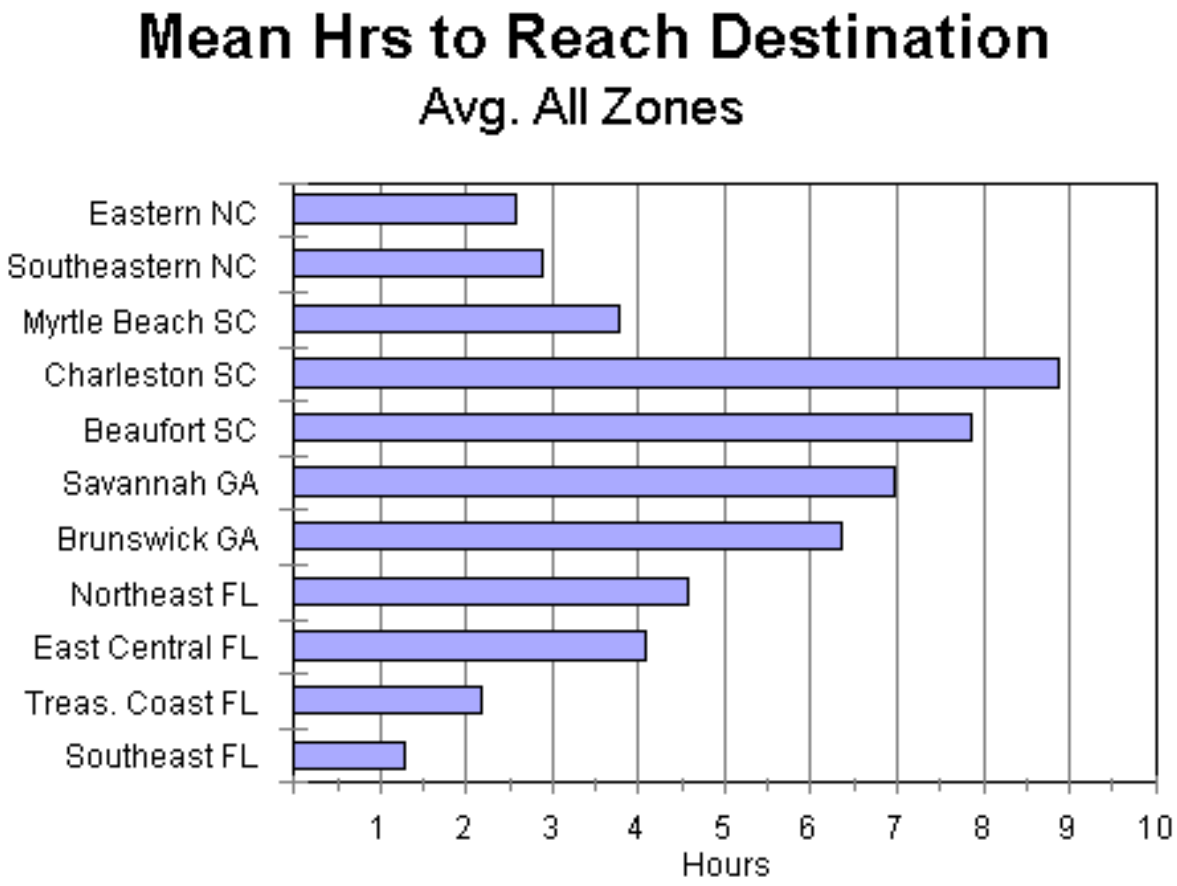

Mean Hrs to Reach Destination
Avg. All Zones
Eastern NC
Southeastern NC
Myrtle Beach SC
Charleston SC
Beaufort SC
Savannah GA
Brunswick GA
Northeast FL
East Central FL
Treas. Coast FL
Southeast FL
1
2
3
4
5
6
7
8
9
10
Hours

Figure 29

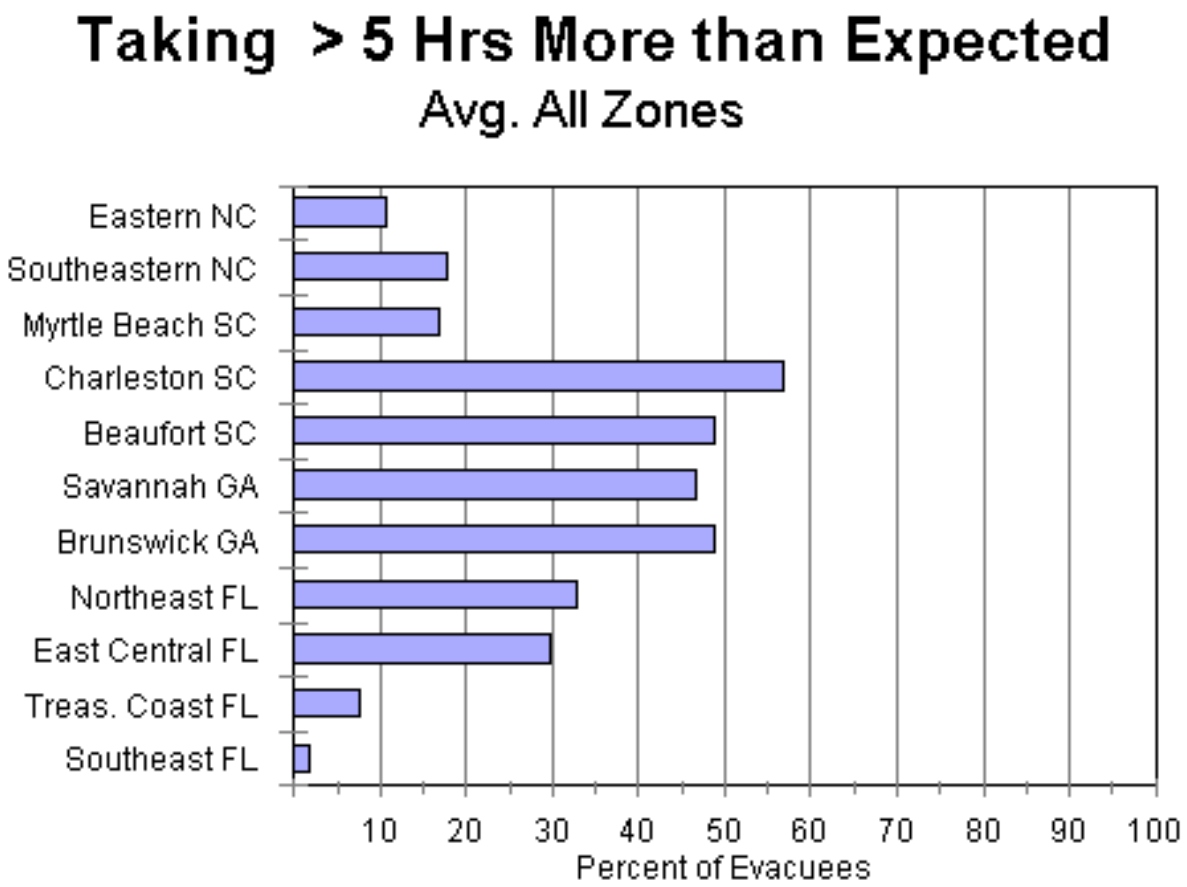
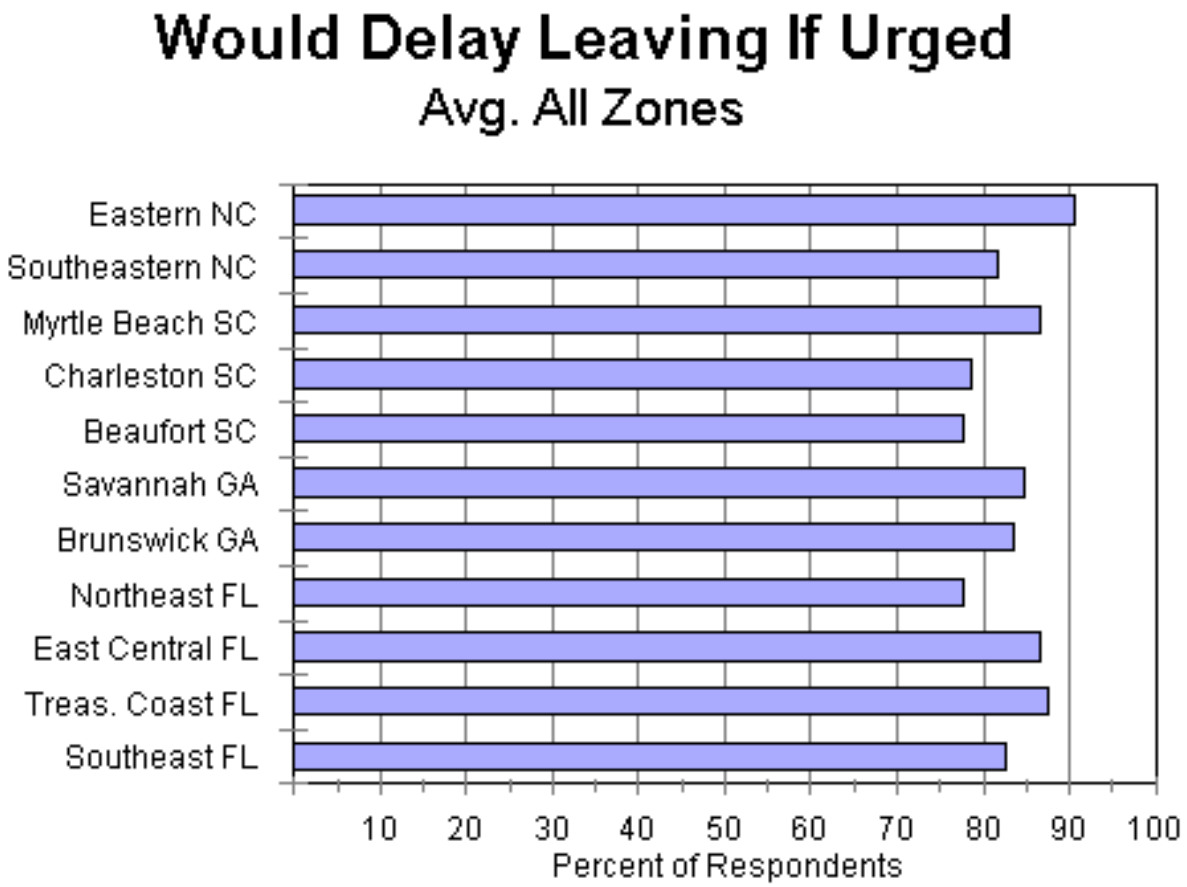

Taking > 5 Hrs More than Expected
Avg. All Zones
Eastern NC
Southeastern NC
Myrtle Beach SC
Charleston SC
Beaufort SC
Savannah GA
Brunswick GA
Northeast FL
East Central FL
Treas. Coast FL
Southeast FL
10
20
30
40
50
60
70
80
90
100
Percent of Evacuees

Figure 30



Between 35% and 60% of the evacuees said they used interstate highways for a substantial portion of their evacuation (Figure 31). Those respondents were asked whether they would use interstates again in the future or use secondary roads. In the area from Jacksonville, FL through Charleston, SC (where evacuation times were longest), most said they would use secondary roads, a combination of secondary and interstate, or that it would depend on circumstances. North and south of those locations (where travel times were shortest) a majority said they would use interstates in the future.

Between 70% and 90% of the respondents said they were familiar with the road systems in the areas through which they were evacuating (Figure 32). This implies that evacuees would be able to take advantage of information about alternative routes if they received the information. In Floyd between 20% and 55% of the evacuees said they heard announcements about evacuation route problems before leaving home (Figure 33). Of those hearing the announcements, approximately 30% changed their plans concerning routes to use in the

evacuation. In most survey locations a majority of evacuees said they heard announcements once they left home about evacuation route problems (Figure 34). About 25% said they changed their route choices while underway as a result.

Evacuees appear to be receptive to route announcements, as evidenced by their behavior in Floyd and also in response to a hypothetical posed in the survey. Respondents were asked whether they would be willing to use a route other than the one they had planned to use if urged to do so be officials in order to avoid congestion, even if the alternative route took them out of their way. More than 70% said they would (Figure 35). The main point is not whether exactly that many would actually comply with such a recommendation but that so many are at least inclined to consider it favorably.

Figure 31

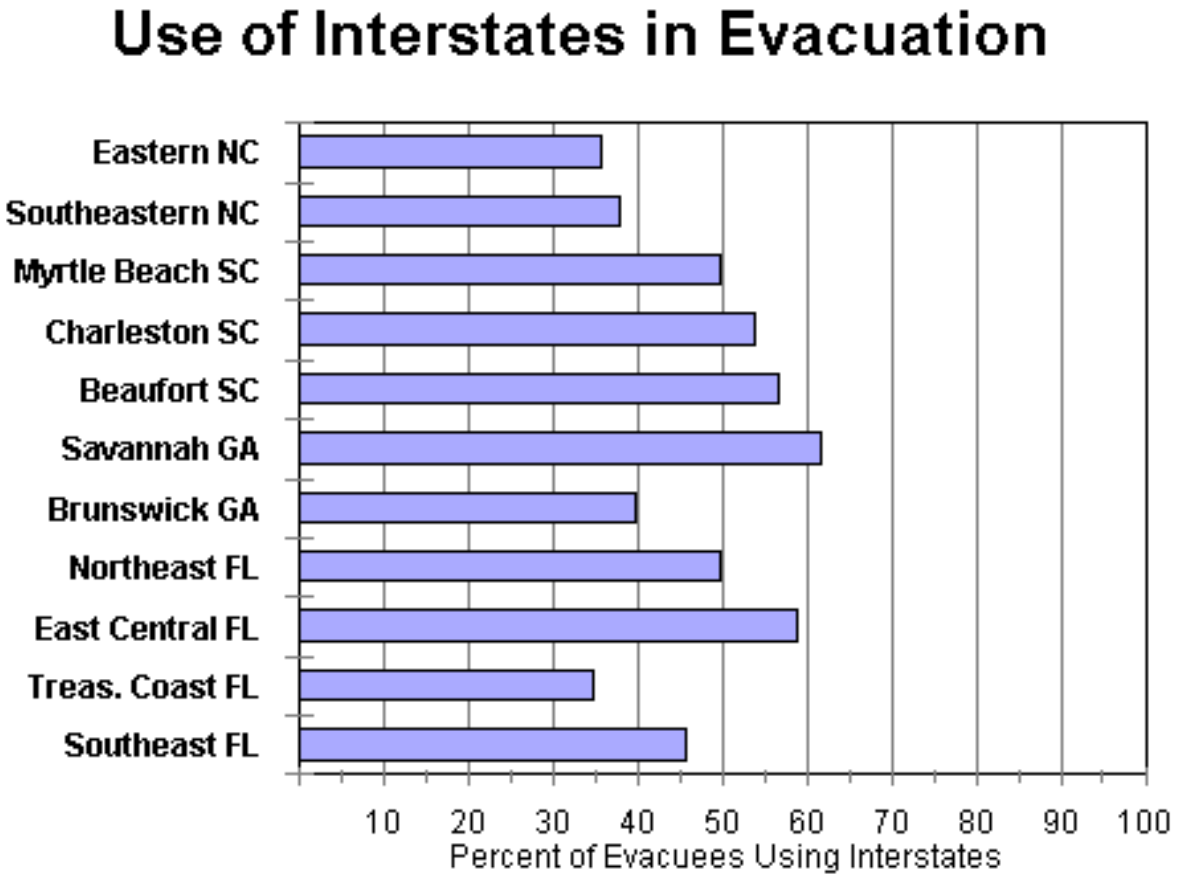


Figure 32

<

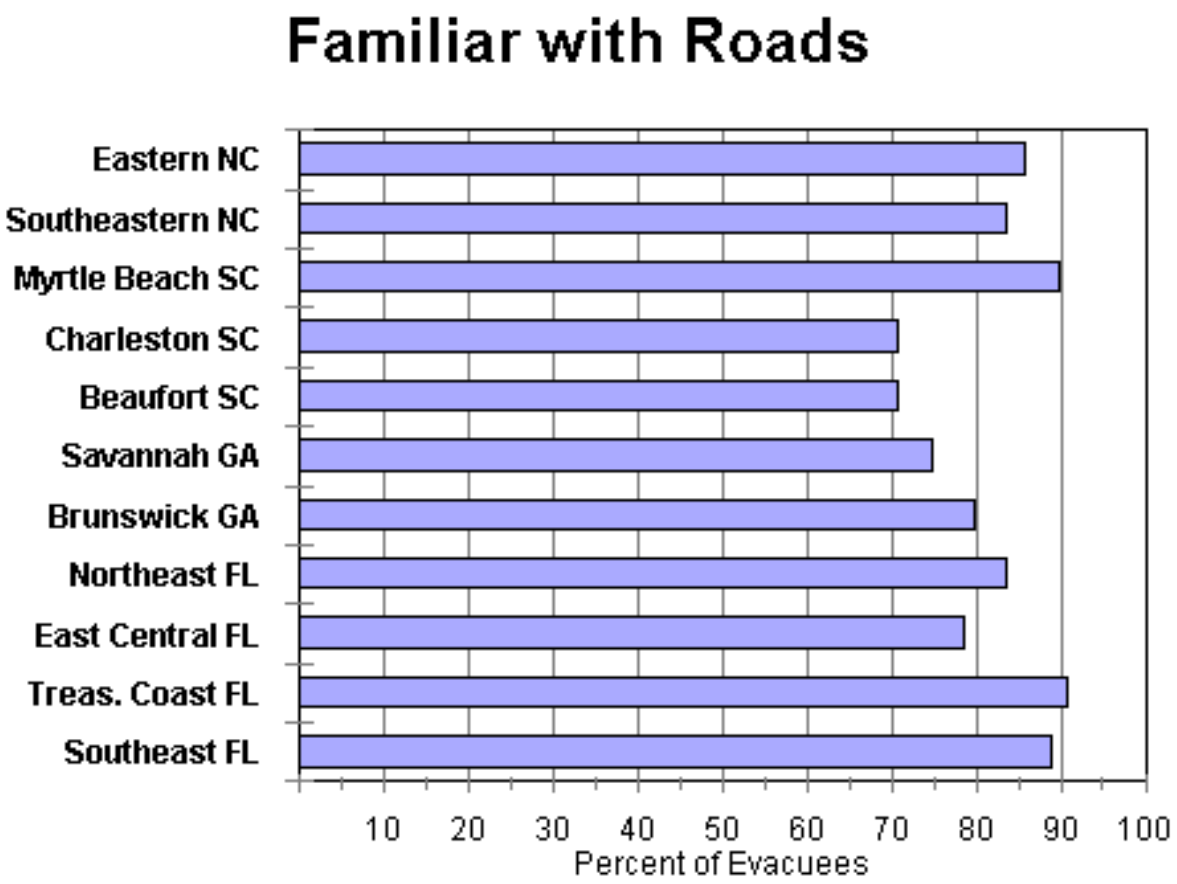

Familiar with Roads
Eastern NC
Southeastern NC
Myrtle Beach SC
Charleston SC
Beaufort SC
Savannah GA
Brunswick GA
Northeast FL
East Central FL
Treas. Coast FL
Southeast FL
10
20
30
40
50
60
70
80
90
100
Percent of Evacuees

Figure 33

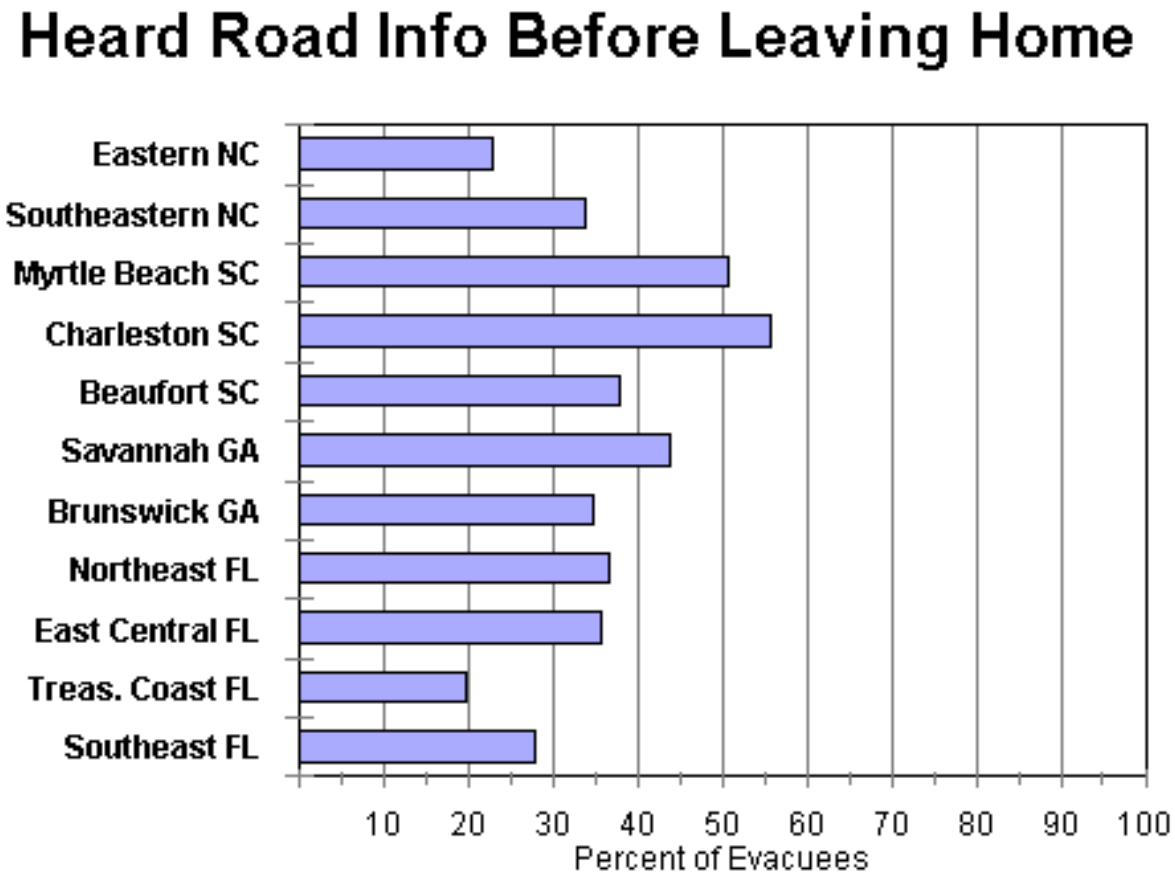

Heard Road Info Before Leaving Home
Eastern NC
Southeastern NC
Myrtle Beach SC
Charleston SC
Beaufort SC
Savannah GA
Brunswick GA
Northeast FL
East Central FL
Treas. Coast FL
Southeast FL
10
20
30
40
50
60
70
80
90
100
Percent of Evacuees

Figure 34

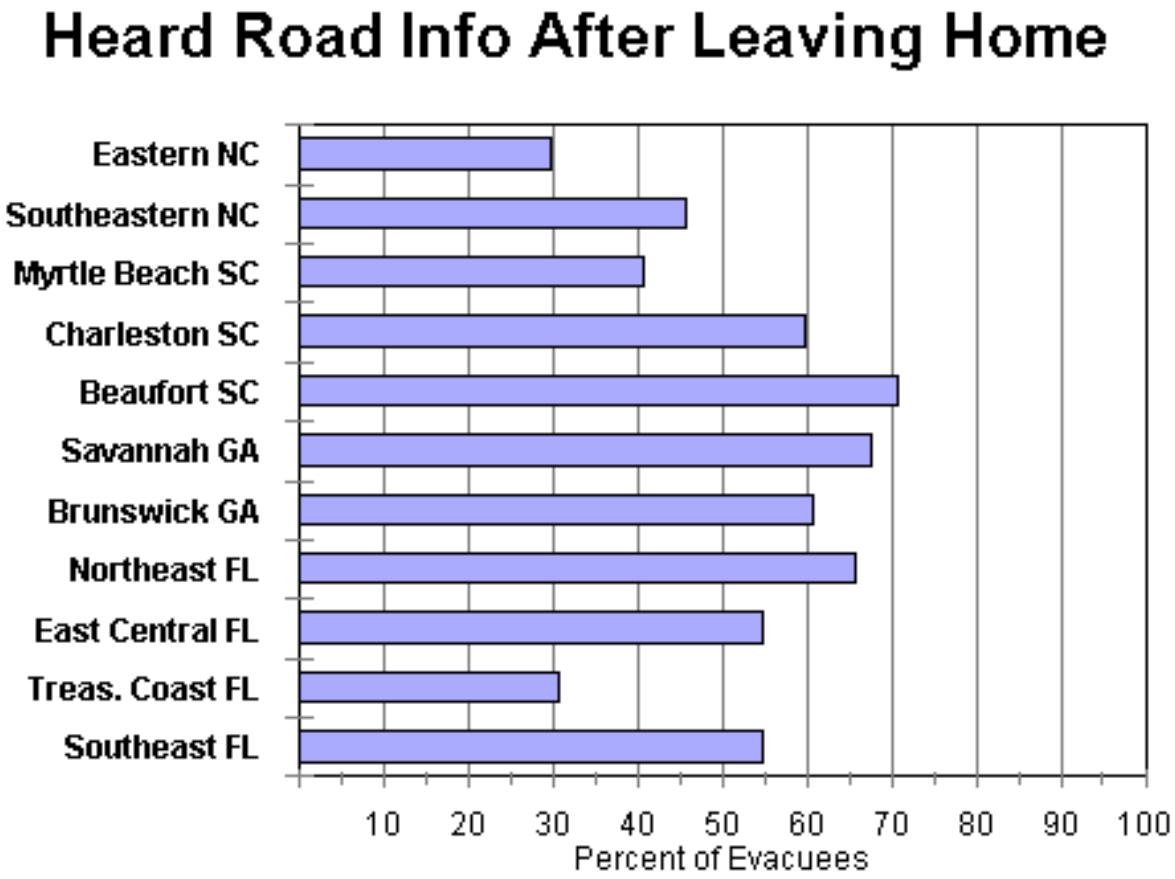
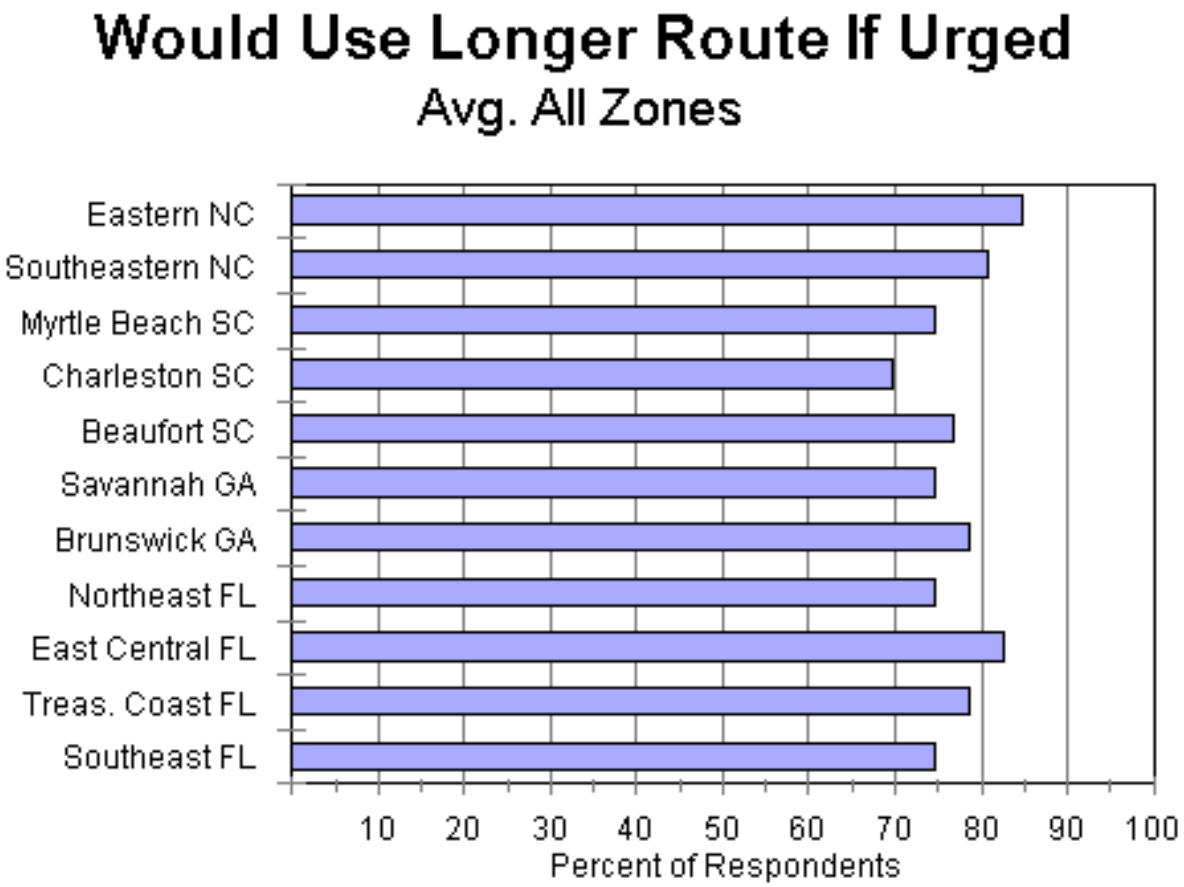

Heard Road Info After Leaving Home
Eastern NC
Southeastern NC
Myrtle Beach SC
Charleston SC
Beaufort SC
Savannah GA
Brunswick GA
Northeast FL
East Central FL
Treas. Coast FL
Southeast FL
10
20
30
40
50
60
70
80
90
100
Percent of Evacuees

Figure 35

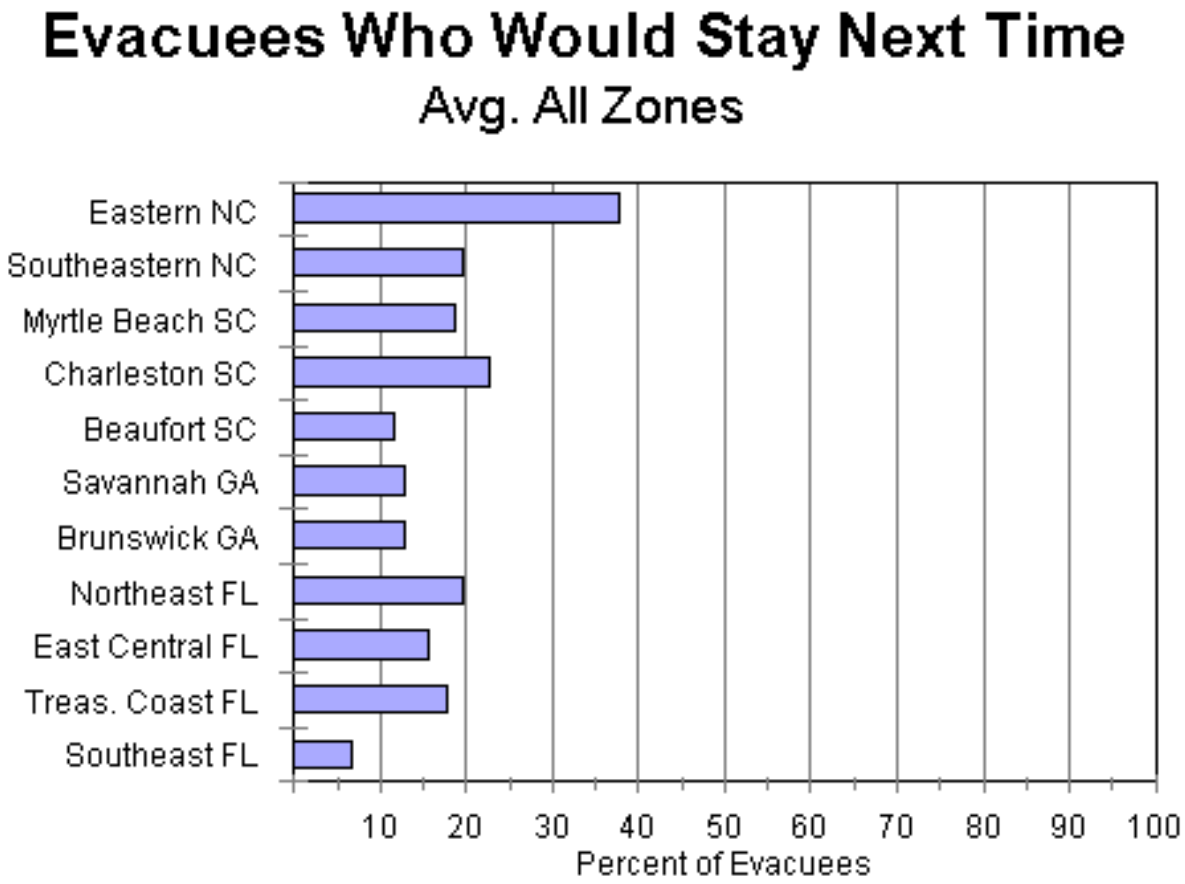


Next Time

One question asked following Floyd was whether the unpleasant experiences during the evacuation would deter people from leaving in future hurricane threats. Certainly many evacuees had bad experiences, but when asked to describe the sorts of difficulties they endured, most respondents, even in Charleston, reported none, other than aggravation. The most common complaint was a lack of restroom facilities, followed by food and water. It is important for public safety officials to recognize the fact that the people who complain about events by contacting agencies, writing newspapers, and so forth don't constitute a random sample of the public.

When asked what they would do differently if faced with a similar hurricane threat in the future, fewer than 20% of the evacuees in most locations said they would not do so again (Figure 36). Some of these respondents didn't need to evacuate in Floyd, so their inclination to stay in the future is not a negative, and most of those who do need to go can be convinced to do so in an actual threat. The most common response when asked what they would do differently was to leave earlier next time.

Figure 36



Chapter 9

Public Response to Hurricane Floyd

In Northern South Carolina

Prepared by

Earl J. Baker

Hazards Management Group, Inc.

Survey Method

Approximately 600 telephone interviews were conducted in the northern region of South Carolina, including the coastal counties of Horry and Georgetown. The sample was stratified as follows:

1. 200 interviews in areas at risk to storm surge in category 1 hurricanes
2. 200 interviews in areas at risk to storm surge in stronger hurricanes
3. 100 interviews in areas of coastal counties not subject to inundation by storm surge
4. 100 interviews in non-coastal counties adjacent to the coastal counties.

Evacuation zones defined in the most recent hurricane evacuation study for the region were used to identify the sampling areas. A copy of the generic questionnaire used in post-Floyd surveys is included as Appendix I.

Statistical Reliability

Figures reported from surveys cited in this report are based upon samples taken from larger populations. The sample values provide estimates of the values of the larger populations from which the samples were selected, but usually are not precisely the same as the true population values. In general, the larger the number of people in the sample, the closer the sample value will be to the true population value. A sample of 200 will provide estimates which one can be 90% “confident” are within 4 to 6 percentage points of the true populations values, whereas a sample of 100 will provide the same degree of confidence of being within 5 to 8 percentage points of the true population values. With a sample of 50, one can be 90% "confident" of being within 7 to 11 percentage points of the actual population value, and a sample of 25 is 90% "accurate" only within 10 to 17 percentage points. With a sample of 50, one can be 90% "confident" of being within 7 to 12 percentage points of the actual population value. A sample of 25 is 90% "accurate" only within 10 to 17 percentage points.

The ranges (e.g., "10 to 17") stem from the fact that the reliability of an estimate depends not only on the size of the sample but also upon how much agreement there is among the responses. Having 90% of the

respondents give a particular answer means almost everyone agreed. By the same reasoning, if only 10% gave a particular response, almost everyone agreed (i.e., 90% disagreed with the 10% but agreed with one another). The maximum disagreement is for the responses to be split 50-50. Thus, if 90% (or 10%) of a sample of 100 give a particular response, that estimate will be within 5 percentage points of the true population value 90% of the time. If 75% (or 25%) of a sample of 100 give a particular response, that estimate will be within 7 percentage points 90% of the time. If 50% of a sample of 100 give a particular response, that estimate will be within 8 percentage points 90% of the time.

Therefore, readers should keep in mind that some estimates provided in this report are more statistically reliable than others. This is particularly noteworthy in drawing conclusions about whether two survey results are "different" from one another. Differences of a few percentage points in sample results of 100 or less do not necessarily mean the populations from which the samples were drawn are different. When the aggregate samples are broken down into subgroups, the reliability of estimates for the subgroups suffers. Tables contain actual sample sizes used to calculate the values reported in the table. Sample sizes vary from table to table because not all questions were asked of all respondents (people who didn't evacuate weren't asked where they went, for example), some respondents refused to answer some questions, and in a few cases responses were invalid. There are so few respondents in certain risk zones for some questions that the results are not useful for generalizations. They are included solely for completeness.

In nearly all tables data refer to percentages of respondents. In some questions respondents could give more than one answer, resulting in totals exceeding 100%.

Evacuation Participation Rates

Evacuation, as used in the survey, refers to leaving one's home to go someplace safer. In the surge areas more than 60% evacuated (Table 1). The "shadow" evacuation in other risk areas (i.e., evacuation from areas not told by officials to evacuate) was substantial, contributing to the evacuating traffic.

Table 1. Percent who left their homes in Floyd, by risk zone

	Cat 1 Surge Zone N=208	Other Surge Zones N=206	Coastal Non-surge N=128	Non-coastal Counties N=109
Evacuated	67	61	37	21

Most of the residents who did not evacuate gave the same reason: they felt their home would be safe enough, given their beliefs about the likely track and strength of the storm (Table 2). No other single reason was prominent in the responses.

Table 2. Why Stayed (Percent of Respondents)

	Cat 1 Surge Zone N=65	Other Surge Zones N=79	Coastal County Non-Surge N=79	Non-coastal Counties N=83
House OK for Storm	46	52	63	90
Officials Said Stay	2	1	4	1
Media Said Stay	2	3	3	1
Friends Said Stay	2	4	4	5
Officials Didn't Say Leave	3	6	4	2
Probabilities Low	8	9	14	2
Other Info. Would Miss	0	6	3	0
No Transport	2	1	0	0
No Place to Go	6	4	1	4
Protect from Looters	2	3	1	1

Table 2. Why Stayed (Percent of Respondents) continued

Protect from Storm	6	1	3	1
Left in Past Miss	12	9	5	10
Job	3	8	4	4
Waited Too Long	3	8	4	4
Traffic	12	10	10	2
Tried, Gave Up	0	0	0	0
Dangerous on Road	6	3	3	0
Pets	2	3	5	1
Required Medical Care	0	0	0	0
Other	12	10	27	2
Don't Know	8	9	0	1

Jobs were mentioned by some, and respondents were asked specifically whether anyone in their household had to work during Floyd and how that affected their evacuation (Tables 3, 4). At least a fifth said someone in the household had to work, and some (but not most) said it either prevented part of the household from evacuating or delayed their departure.

Table 3. Someone in Household Had to Work in Floyd

	Cat 1 Surge Zone N=208	Other Surge Zones N=206	Coastal County Non-surge N=127	Non-coastal Counties N=109
Yes	21	25	31	27

No	89	75	69	73

Table 4. How Work Affected Evacuation in Floyd

	Cat 1 Surge Zone N=44	Other Surge Zones N=52	Coastal County Non-surge N=39	Non-coastal Counties N=29
None	61	50	59	83
Kept All from Leaving	7	6	10	3
Kept Part from Leaving	2	6	0	0

Delayed All in Leaving	18	27	15	10
Delayed Part in Leaving	7	6	3	0
Other	5	6	13	3

Those who didn't evacuate were asked whether they would have left had they been convinced the storm was going to strike, and in coastal counties more than half said they would have (Table 5). Most also said they had made the necessary preparations to leave in case conditions worsened (Table 6).

Table 5. Stayers Who Say They Would Have Left If Convinced Storm Was Going to Hit

	Cat 1 Surge Zone N=68	Other Surge Zones N=81	Coastal County Non-surge N=79	Non-coastal Counties N=85
Would Have Left	69	53	52	40
Wouldn't Have Left	27	38	27	45
Don't Know	4	9	22	15

Table 6. Stayers Who Say They Had Made Necessary Preparations to Leave

	Cat 1 Surge Zone N=68	Other Surge Zones N=81	Coastal County Non-surge N=81	Non-coastal Counties N=85

Had Prepared	78	67	65	58
Hadn't Prepared	21	32	35	39
Don't Know	2	1	0	4

Evacuees were asked what convinced them to leave, and most indicated some combination of response to actions by public officials, messages from friends and media, and concern about storm conditions (Table 7.)

Table 7. Why Left (Percent of Respondents)

	Cat 1 Surge Zone N=137	Other Surge Zones N=123	Coastal County Non-surge N=46	Non-coastal Counties N=21
Officials Said Leave	20	22	11	5
NWS Said Leave	13	18	11	10
Police/Fire Said Leave	2	6	0	5
Media Said Leave	15	23	7	14
Friend Said Leave	17	12	22	14
Storm Severe	31	24	26	29
Heard "Bad as Hugo/ Andrew"	10	6	9	5
Increased in Strength	6	3	20	0
Concerned about Flooding	7	7	4	10

Concerned about Winds	12	19	28	24
Concerned re. Road Flooding	2	1	2	0
Probability of Hit	12	16	20	10
Post-Storm Concerns	4	10	26	0
Other	12	10	26	0
Don't Know	0	1	2	5

In an attempt to separate the effect of messages disseminated by government officials via the media from the effect of other information heard via the media, respondents were asked which had the greater impact on their decision to evacuate. Information from officials had the greater impact in three of the four risk areas, according to respondents (Table 8).

Table 8. Greatest Influence to Leave (Percent of Respondents)

	Cat 1 Surge Zone N=137	Other Surge Zones N=121	Coastal County Non-surge N=46	Non-coastal Counties N=22
Media Info from Gov't Officials	46	60	33	55

Other Media Info	32	29	42	18
Info from Friends	18	10	22	27
Other	8	5	2	5
Don't Know	2	2	7	0

Interviewees were also asked whether they heard from officials – either directly or indirectly – that they should evacuate. In surge areas a majority said they did (Table 9). Those who did hear evacuation notices were more likely than others to evacuate, particularly if they believed the notice to be mandatory (Table 10).

Table 9. Heard Evacuation Notices from Officials

	Cat 1 Surge Zone N=208	Other Surge Zones N=205	Coastal County Non-Surge N=127	Non-coastal Counties N=108
Heard Notices	69	55	25	19
Didn't Hear	30	43	72	80
Don't Know	1	2	2	1

Table 10. Evacuation Participation Rates, by Hearing Evacuation Notices from Officials (Sample sizes vary by cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Heard Must	84	76	78	50
Heard Should	63	65	63	44
Didn't Hear	52	46	28	15

Quite a few people in the coastal counties, even those living in surge zones, believe they would be safe in a 125 MPH hurricane in their own homes (Table 11a). In all four risk zones people who perceived their homes to be vulnerable were more likely than others to evacuate (Table 11b).

Table 11a. Perceived Safety of Home from Wind and Water in 125 MPH Hurricane

	Cat 1 Surge Zone N=208	Other Surge Zones N=205	Coastal County Non-Surge N=127	Non-coastal Counties N=108
Safe	39	46	38	51
Unsafe	53	42	48	37
Don't Know	8	12	15	12

Table 11b. Evacuation Participation Rates, by Perceived Safety in 125 MHP Storm (See previous table for sample sizes for each cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Safe	53	56	21	13
Unsafe	76	70	53	33
Didn't Hear	75	50	26	23

Evacuation Timing

Evacuation departures were fairly gradual, primarily during September 14 and 15, with the steepest portion of the response on the 15th. Thirty-five percent of the eventual evacuees had left by noon on the 14th, and 70% had left by 6AM on the 15th. A hurricane watch was issued for the area at 11 PM on the 13th, followed by a warning at 5 PM on the 14th.

Use of Public Shelters and Other Refuges

The great majority of evacuees went to the homes of friends and relatives or to hotels and motels (Table 12). Six percent or fewer of those interviewed said they went to public shelters.

Table 12. Refuges Uses by Evacuees

	Cat 1 Surge Zone N=132	Other Surge Zones N=121	Coastal County Non-Surge N=47	Non-coastal Counties N=23
Public Shelter	2	3	6	0
Church	0	3	6	13
Friend/Relative	67	60	68	70
Hotel/Motel	24	28	13	13
Workplace	0	2	2	4
Other	6	5	4	0

Evacuation Destinations and Transportation Issues

Most coastal evacuees left their own county (Table 13). Slightly fewer than half went to destinations in South Carolina, with 33% going into North Carolina (Table 14).

Table 13. Percent of evacuees by destination, by risk zone

	Cat 1 Surge Zone N=136	Other Surge Zones N=122	Coast Non-Surge N=48	Non-Coastal Counties N=23
Own Neighborhood	5	6	33	57
Own County	16	11	10	17
Out of County	79	83	56	26

Table 14. Percent of out-of-county evacuees, by state destination

Florida	<1
Georgia	8
South Carolina	47
North Carolina	33
Virginia	5
Alabama	<1
Tennessee	3
Other	4

Going out of county was motivated by three main factors: the strength of the storm, the location of friends and family, and the lack of closer motels (Table 15). In category1 surge areas information from government officials conveyed by the media had about the same influence as other media information (Table 16). Outside the category1 surge areas government information had a greater influence.

Table 15. Why Went Out of County

	Cat 1 Surge Zone N=107	Other Surge Zone N=101	Coastal County Non-surge N=27	Non-coastal Counties N=6
Strength of Storm	26	26	30	17
Previous Hurri-cane Experience	8	7	7	0
Comparisons to Hugo/Andrew	3	9	4	0

Officials Said Leave County	2	4	0	0
Media Said Leave County	5	1	0	0
Friend Said Leave County	10	12	15	0
Friend Lives in Destination	42	44	52	50
No Public Shelter Closer	3	6	0	0
No Motels Closer	19	20	15	33
Other	19	13	15	0
Don't Know	1	2	0	0

Table 16. Greatest Influence for Going Out of County

	Cat 1 Surge Zone N=105	Other Surge Zones N=105	Coastal County Non-surge N=27	Non-coastal Counties N=5
Media Info from Gov't Officials	33	51	52	20
Other Media Info	30	17	22	20
Info from Friends	28	25	41	40
Other	15	9	0	20
Don't Know	3	4	4	0

More than 80% of the evacuees eventually reached their destinations (Table 17). Of those who changed destinations, most went someplace farther than anticipated (Table 18). Too few changed destinations to elicit useful insights regarding reasons for making the changes (Table 19).

Table 17. Whether Reached Original Destination

	Cat 1 Surge Zone N=136	Other Surge Zones N=123	Coastal County Non-surge N=47	Non-coastal Counties N=23
Yes	90	83	89	100
No	9	15	9	0
Don't Know	1	2	2	0

Table 18. Proximity of New Destination, Compared to Original Destination

	Cat 1 Surge Zone N=12	Other Surge Zones N=18	Coastal County Non-surge N=4	Non-coastal Counties N=0
Farther	58	61	100	
Closer	33	33	0	

Same	8	0	0	
Don't Know	0	6	0	

Table 19. Why Changed Destination

	Cat 1 Surge Zone N=11	Other Surge Zones N=17	Coastal County Non-surge N=4	Non-coastal Counties N=0
Traffic	0	18	0	
Better Route	0	6	0	
Loc. of Refuge	9	18	25	
Out of Gas	0	0	0	
Tired	9	12	25	
Hungry	0	0	0	
Bathroom	0	0	0	
Storm Strengthened	18	24	0	
Storm Close	18	12	0	
Other	55	24	50	
Don't Know	0	12	0	

Most people from surge areas, and almost half from other parts of coastal counties said they heard about traffic problems on evacuation routes before leaving home (Table 20). Of those who heard about such problems before leaving home, most did not change their evacuation route plans (Table 21).

Table 20. Heard About Evacuation Route Problems Before Leaving Home

	Cat 1 Surge Zone N=137	Other Surge Zones N=122	Coastal County Non-surge N=47	Non-coastal Counties N=23
Yes	51	58	45	26
No	46	41	53	74
Don't Know	3	1	2	0

Table 21. Changed Routes Because of Information Heard Before Leaving Home

	Cat 1 Surge Zone N=70	Other Surge Zones N=71	Coastal County Non-surge N=20	Non-coastal Counties N=6
Yes	24	28	15	33
No	76	72	85	67

Those who said they had heard about evacuation problems before leaving home were also asked whether they heard about such problems after leaving home. Fewer than half said they did (Table 22). Most of those who did hear did not change their route plans accordingly (Table 23).

Table 22. Heard About Evacuation Route Problems After Leaving Home

	Cat 1 Surge Zone N=70	Other Surge Zone N=71	Coastal County Non-surge N=21	Non-coastal Counties N=6
Yes	40	42	43	17
No	59	55	57	83
Don't Know	1	3	0	0

Table 23. Changed Routes Because of Information Heard After Leaving Home

	Cat 1 Surge Zone N=28	Other Surge Zones N=30	Coastal County Non-surge N=9	Non-coastal Counties N=1
Yes	25	33	11	0
No	75	67	89	100

Most evacuees from surge areas used interstate highways for at least part of their evacuation (Table 24). Those who used interstates in Floyd were inclined to use them again (Table 25). The great majority of the respondents said they were familiar with the roads in the area through which they evacuated (Table 26). More than 70% also said they would be willing to use a different route than they would normally use if government officials urged them to do so to avoid congestion, even if the route took them out of their way (Table 27).

Table 24. Used Interstate for at Least Part of Route

	Cat 1 Surge Zone N=137	Other Surge Zones N=123	Coastal County Non-surge N=46	Non-coastal Counties N=23
Yes	55	51	44	26
No	45	48	57	74
Don't Know	1	1	0	0

Table 25. Routes to be Used in the Future

	Cat 1 Surge Zone N=75	Other Surge Zones N=62	Coastal County Non-surge N=20	Non-coastal Counties N=6
Interstate	63	68	75	50
Secondary Roads	13	11	0	33
Both	5	5	15	0
Depends on Traffic	1	13	5	0
Depends on Other	8	0	5	17

Other	1	0	0	0
Don't Know	8	3	0	0

Table 26. Familiar with Roads in Area

	Cat 1 Surge Zone N=136	Other Surge Zones N=124	Coastal County Non-surge N=47	Non-coastal Counties N=23
Yes	89	86	100	96
No	10	13	0	4
Don't Know	2	2	0	0

Table 27. Would Use Routes Advised by Officials, Even if Longer

	Cat 1 Surge Zone N=136	Other Surge Zones N=124	Coastal County Non-surge N=46	Non-coastal Counties N=22
Yes	72	74	78	91
No	11	12	2	0
Depends How Much Longer	3	7	2	9
Depends on Other	10	6	15	0
Other	2	0	0	0
Don't Know	3	1	2	0

Less than half the respondents said it took them five or more hours to reach their destination (Table 28). Still, times were longer than expected (Table 29). When asked how long it was reasonable for an evacuation like Floyd's to take, most respondents gave times shorter than the actual evacuation but slightly longer than their original expectation (Table 30).

Table 28. Hours Required to Reach Destination

	Cat 1 Surge Zone N=134	Other Surge Zones N=120	Coastal County Non-surge N=47	Non-coastal Counties N=23
Less than 2	34	36	62	91
2 to 5	37	38	19	9
5 to 10	24	20	19	0
10 or more	5	7	0	0

Mean No. Hrs	4.2	4.2	2.8	.5
Median No. Hrs	3.5	3.0	1.5	.5

Table 29. Hours Expected to Reach Destination

	Cat 1 Surge Zone N=130	Other Surge Zones N=112	Coastal County Non-surge N=45	Non-coastal Counties N=23
Less than 2	39	40	62	96
2 to 5	44	46	24	4
5 to 10	14	12	13	0
10 or more	3	2	0	0
Mean No. Hrs	3.4	3.2	2.3	.5
Median No. Hrs	3.0	3.0	1.0	.5

Table 30. Hours Reasonable to Reach Destination

	Cat 1 Surge Zone N=123	Other Surge Zones N=104	Coastal County Non-surge N=44	Non-coastal Counties N=22
Less than 2	37	41	59	96

2 to 5	36	37	18	5
5 to 10	25	20	23	0
10 or more	2	2	0	0
Mean No. Hrs	3.9	3.5	3.0	.5
Median No. Hrs	3.0	3.0	1.8	.5

Most people thought the traffic delays were caused mainly by the sheer volume of traffic and the fact that too many people left at once (Table 31). Some also cited poor traffic management, and a few advocated reversing lane directions. More than 80% of the respondents said they would be willing to cooperate in a phased evacuation in which they would delay their departure for a few hours until people in a more dangerous location had begun their evacuation (Table 32).

Table 31. Why Traffic Was Slow

	Cat 1 Surge Zone N=136	Other Surge Zones N=124	Coastal County Non-surge N=47	Non-coastal Counties N=22
Number of Cars	29	45	36	22
All Left at Once	29	43	38	30
Waited too Long	6	14	13	0
Construction	2	2	0	4
Accidents	4	2	9	0
Poor Traffic Management	12	22	4	13
Need Reverse Lanes	5	9	0	0
Bad Weather	6	7	17	0

Other	24	9	4	9
Don't Know	23	19	38	57

Table 32. Would Delay Departure if Urged by Officials

	Cat 1 Surge Zone N=208	Other Surge Zones N=205	Coastal County Non-surge N=128	Non-coastal Counties N=108
Yes	82	88	91	88
Depends on Storm's Proximity	3	4	2	2
Depends on Storm's Strength	5	1	2	0
Other	1	1	0	0
Don't Know	3	3	4	7
No	5	3	2	4

Over 90% of the evacuees did not cite specific difficulties experienced during the evacuation. Needing restroom facilities was most common, but a few had mechanical breakdowns (Table 33). About half of the evacuees said they heard about places where they could find shelter if they weren't able to reach their destinations (Table 34). Few changed their plans about seeking shelter as a result (Table 35). Many interviewees reported roads being blocked by water when returning from the evacuation, but most reported no difficulties (Table 36).

Table 33. Difficulties Experienced in Evacuation

	Cat 1 Surge Zone N=136	Other Surge Zones N=124	Coastal County Non-surge N=47	Non-coastal Counties N=22
Ran Out of Gas	0	0	0	0
Car Broke Down	2	2	0	0
Needed Water	0	0	0	0
Needed Food	2	1	0	0
Needed Restroom	4	2	0	0
Other Difficulties	0	0	0	0
No Difficulties	94	96	100	100

Table 34. Heard About Refuge Options After Leaving Home

	Cat 1 Surge Zone N=136	Other Surge Zones N=124	Coastal County Non-surge N=47	Non-coastal Counties N=22
Yes	43	41	45	46
No	51	52	55	50
Don't Know	7	7	0	5

Table 35. Changed Plans Because of Refuge Information Heard After Leaving Home

	Cat 1 Surge Zone N=57	Other Surge Zones N=50	Coastal County Non-surge N=21	Non-coastal Counties N=10
Yes	2	4	5	0
No	98	96	95	100

Table 36. Difficulties Experienced Returning from Evacuation

	Cat 1 Surge Zone N=136	Other Surge Zones N=124	Coastal County Non-surge N=50	Non-coastal Counties N=23
Lack of Information	0	1	0	0
Roads Blocked by Water/Debris	17	12	26	9
Traffic Congested	6	8	4	0
Re-entry Not Permitted	1	1	4	0
Other Difficulties	0	0	4	0
No Difficulties	78	82	68	99

Vehicle use was close to that in most evacuations, in which 65% to 75% of the available vehicles are used (Table 37). Few households required assistance in evacuating, and in no one said outside agencies were required (Table 38).

Table 37. Vehicle Use by Evacuating Households

	Cat 1 Surge Zone N=137	Other Surge Zones N=123	Coastal County Non-surge N=47	Non-coastal Counties N=22
Percent of Available	59	63	63	69
Avg. Number Per Household	1.18	1.25	1.26	1.09
Pulled Trailer, Took Motorhome	4	1	2.3	0

Table 38. Required Assistance in Evacuating (As a Percent of All Households)

	Cat 1 Surge Zone N=137	Other Surge Zones N=124	Coastal County Non-surge N=47	Non-coastal Counties N=23
Yes, Within Household	2	1	9	0
Yes, Friend/ Relative	1	3	2	4
Yes, Agency	0	0	0	0
No	97	96	89	96

Local television was relied upon most heavily by the respondents for information about Floyd, followed by The Weather Channel (Table 39). Local radio and CNN were then next most relied-upon sources of information.

Table 39. Sources Relied On a Great Deal for Information about Floyd

	Cat 1 Surge Zone N=207	Other Surge Zones N=202	Coastal County Non-surge N=128	Non-coastal Counties N=108
Local Radio	27	31	27	23
Local Television	75	73	75	87
CNN	29	27	28	22

Weather Channel	63	63	66	46
Other Cable	8	9	6	4
Internet	9	6	3	2
AOL	4	3	0	1
Word of Mouth	10	10	13	8

Most respondents in the sample said they wouldn't do anything differently if faced with the same circumstances again as in Floyd (Table 40). Some who left wouldn't, but some who didn't leave would. Some would plan to leave earlier.

Table 40. Would Do Differently Next Time

	Cat 1 Surge Zone N=208	Other Surge Zones N=205	Coastal County Non-surge N=128	Non-coastal Counties N=109
Would Leave	5	8	5	7
Wouldn't Leave	14	12	4	3
Leave Earlier	8	9	6	5
Leave Later	4	2	1	0
Go Farther	3	2	0	1
Go Closer	3	2	2	0
Use Public Shelter	0	0	1	0
Not Use Pub Shltr	1	2	0	0
Different Route	1	2	2	1
Buy Gasoline	2	2	1	0
Take Provisions	4	2	1	1
Other	2	5	8	5
Don't Know	5	3	5	7
Nothing Different	63	64	76	71

Chapter 1

Public Response to Hurricane Floyd

In Dade and Broward Counties, Florida

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Survey Method

Approximately 600 telephone interviews were conducted in Dade and Broward Counties, Florida. The sample was stratified as follows:

1. 200 interviews in areas at risk to storm surge in category 1 hurricanes

2. 200 interviews in areas at risk to storm surge in stronger hurricanes

3. 200 interviews in areas of coastal counties not subject to inundation by storm surge

Evacuation zones defined in the most recent hurricane evacuation study for the region were used to identify the sampling areas. A copy of the generic questionnaire used in post-Floyd surveys is included as Appendix I.

Statistical Reliability

Figures reported from surveys cited in this report are based upon samples taken from larger populations. The sample values provide estimates of the values of the larger populations from which the samples were selected, but usually are not precisely the same as the true population values. In general, the larger the number of people in the sample, the closer the sample value will be to the true population value. A sample of 200 will provide estimates which one can be 90% “confident” are within 4 to 6 percentage points of the true populations values, whereas a sample of 100 will provide the same

degree of confidence of being within 5 to 8 percentage points of the true population values. With a sample of 50, one can be 90% "confident" of being within 7 to 11 percentage points of the actual population value, and a sample of 25 is 90% "accurate" only within 10 to 17 percentage points. With a sample of 50, one can be 90% "confident" of being within 7 to 12 percentage points of the actual population value. A sample of 25 is 90% "accurate" only within 10 to 17 percentage points.

The ranges (e.g., "10 to 17") stem from the fact that the reliability of an estimate depends not only on the size of the sample but also upon how much agreement there is among the responses. Having 90% of the respondents give a particular answer means almost everyone agreed. By the same reasoning, if only 10% gave a particular response, almost everyone agreed (i.e., 90% disagreed with the 10% but agreed with one another). The maximum disagreement is for the responses to be split 50-50. Thus, if 90% (or 10%) of a sample of 100 give a particular response, that estimate will be within 5 percentage points of the true population value 90% of the time. If 75% (or 25%) of a sample of 100 give a particular response, that estimate will be within 7 percentage points 90% of the time. If 50% of a sample of 100 give a particular response, that estimate will be within 8 percentage points 90% of the time.

Therefore, readers should keep in mind that some estimates provided in this report are more statistically reliable than others. This is particularly noteworthy in drawing conclusions about whether two survey results are "different" from one another. Differences of a few percentage points in sample results of 100 or less do not necessarily mean the populations from which the samples were drawn are different. When the aggregate samples are broken down into subgroups, the reliability of estimates for the subgroups suffers. Tables contain actual sample sizes used to calculate the values reported in the table. Sample sizes vary from table to table because not all questions were asked of all respondents (people who didn’t evacuate weren’t asked where they went, for example), some respondents refused to answer some questions, and in a few cases responses were invalid. There are so few respondents in certain risk zones for some questions that the results are not useful for generalizations. They are included solely for completeness.

In nearly all tables data refer to percentages of respondents. In response to some questions respondents could give more than one answer, resulting in totals exceeding 100%.

Evacuation Participation Rates

Evacuation, as used in the survey, refers to leaving one’s home to go someplace safer. In the category 1 risk zone, only a third evacuated, as did 12% in other surge zones and 10% in the non-surge area (Table 1). Only residents of category 1 surge areas were ordered to evacuate. Evacuees leaving from other areas – unless they lived in mobile homes – were “shadow” evacuees.

Table 1. Percent who left their homes in Floyd, by risk zone

	Cat 1 Surge Zone N=201	Other Surge Zones N=204	Coastal Non-surge N=204
Evacuated	34	12	10

Most of the residents who did not evacuate gave the same reason: they felt their home would be safe enough, given their beliefs about the likely track and strength of the storm (Table 2). No other single reason was prominent in the responses.

Table 2. Why Stayed (Percent of Respondents)

	Cat 1 Surge Zone N=130	Other Surge Zones N=168	Coastal County Non-Surge N=176
House OK for Storm	68	61	67
Officials Said Stay	2	5	6
Media Said Stay	6	6	2
Friends Said Stay	3	4	1
Officials Didn't Say Leave	9	11	12

Probabilities Low	18	9	9
Other Info. Would Miss	9	2	3
No Transport	1	1	1
No Place to Go	1	6	2
Protect from Looters	1	1	2

Table 2. Why Stayed (Percent of Respondents) continued

Protect from Storm	2	2	2
Left in Past Miss	10	5	2
Job	5	3	5
Waited Too Long	1	1	0
Traffic	2	1	1
Tried, Gave Up	1	0	0
Dangerous on Road	2	1	0
Pets	2	2	2
Required Medical Care	2	1	0
Other	9	17	9
Don’t Know	2	3	1

Jobs were mentioned by some, and all respondents were asked specifically whether anyone in their household had to work during Floyd and how that affected their evacuation (Tables 3, 4). More than a fourth said someone in the household had to work, and some (but not most) said it either prevented

part of the household from evacuating or delayed their departure.

Table 3. Someone in Household Had to Work in Floyd

	Cat 1 Surge Zone N=201	Other Surge Zones N=204	Coastal County Non-surge N=205
Yes	28	35	42
No	72	65	58

Table 4. How Work Affected Evacuation in Floyd

	Cat 1 Surge Zone N=55	Other Surge Zones N=70	Coastal County Non-surge N=85
None	67	86	91
Kept All from Leaving	9	6	5
Kept Part from Leaving	2	0	0
Delayed All in Leaving	7	6	2
Delayed Part in Leaving	7	0	0
Other	7	3	2

Those who didn't evacuate were asked whether they would have left had they been convinced the storm was going to strike, and more than half in the surge zones said they would have (Table 5). Most in surge zones also said they had made the necessary preparations to leave in case conditions worsened (Table 6).

Table 5. Stayers Who Say They Would Have Left If Convinced Storm Was Going to Hit

	Cat 1 Surge Zone N=133	Other Surge Zones N=179	Coastal County Non-surge N=182

Would Have Left	62	54	48
Wouldn't Have Left	66	36	41
Don't Know	12	11	11

Table 6. Stayers Who Say They Had Made Necessary Preparations to Leave

	Cat 1 Surge Zone N=133	Other Surge Zones N=179	Coastal County Non-surge N=184
Had Prepared	70	63	50
Hadn't Prepared	30	36	50
Don't Know	0	1	1

Evacuees were asked what convinced them to leave, and most indicated some combination of response to actions by public officials, media messages, appeals from friends, and concern about storm conditions (Table 7.)

Table 7. Why Left (Percent of Respondents)

	Cat 1 Surge Zone N=66	Other Surge Zones N=22	Coastal County Non-surge N=16
Officials Said Leave	24	14	19
NWS Said Leave	12	14	19
Police/Fire Said Leave	9	0	0
Media Said Leave	29	23	0
Friend Said Leave	17	14	13
Storm Severe	24	9	25
Heard “Bad as Hugo/ Andrew”	9	5	0
Increased in Strength	2	0	0
Concerned about Flooding	11	18	31
Concerned about Winds	21	36	13
Concerned re. Road Flooding	0	5	6
Probability of Hit	12	5	19
Post-Storm Concerns	0	5	0
Other	15	27	19
Don’t Know	0	0	0

In an attempt to separate the effect of messages disseminated by government officials via the media from the effect of other information heard via the media, respondents were asked which had the greater impact on their decision to evacuate. Information from officials had the greater impact in all three risk zones, according to respondents (Table 8).

Table 8. Greatest Influence to Leave (Percent of Respondents)

	Cat 1 Surge Zone N=66	Other Surge Zones N=22	Coastal County Non-surge N=16
Media Info from Gov't Officials	61	50	56
Other Media Info	29	27	25
Info from Friends	17	14	25
Other	3	27	0
Don't Know	2	0	0

Interviewees were also asked whether they heard from officials – either directly or indirectly – that they should evacuate. Only in the category 1 risk area did close to half say they did (Table 9). Those who did hear evacuation notices were more likely than others to evacuate, particularly if they believed the

notice to be mandatory (Table 10).

Table 9. Heard Evacuation Notices from Officials

	Cat 1 Surge Zone N=201	Other Surge Zones N=204	Coastal County Non-Surge N=205
Heard Notice	42	16	8
Didn't Hear	53	79	91
Don't Know	5	5	1

Table 10. Evacuation Participation Rates, by Hearing Evacuation Notices from Officials (Sample sizes vary by cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge
Heard Must	66	46	75
Heard Should	32	37	30
Didn't Hear	26	6	7

Only in the category 1 surge zone did more than half the respondents say they would be unsafe in a 125 MPH hurricane in their own homes, and even there the majority was slight (Table 11a). A fourth of those living in non-surge areas said they would be unsafe. In all four risk zones people who perceived their homes to be vulnerable were more likely than others to evacuate in Floyd (Table 11b).

Table 11a. Perceived Safety of Home from Wind and Water in 125 MPH Hurricane

	Cat 1 Surge Zone N=201	Other Surge Zones N=204	Coastal County Non-Surge N=205
Safe	33	48	60
Unsafe	55	36	25
Don't Know	12	15	15

Table 11b. Evacuation Participation Rates, by Perceived Safety in 125 MHP Storm (See previous table for sample sizes for each cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge

Safe	18	5	3
Unsafe	43	21	20
Don’t Know	33	13	20

Evacuation Timing

Evacuation departures were fairly gradual, primarily during September 13 and 14, with most of the response occurring on the 13th. Over 60% percent of the eventual evacuees had left before 6 AM on the 14th. A hurricane watch was issued for Broward at 5 AM on the 13th, and at 11 AM for Dade. A warning was issued for both at 5 PM on the 13th.

Use of Public Shelters and Other Refuges

The great majority of evacuees went to the homes of friends and relatives or to hotels and motels (Table 12). Only three percent of those interviewed from category 1 surge areas said they went to public shelters. The figures were higher for evacuees from other surge areas and lower for those from non-surge areas, but both of those statistics are unreliable due to the small number of evacuees interviewed from those locations.

Table 12. Refuges Uses by Evacuees

	Cat 1 Surge Zone N=60	Other Surge Zones N=23	Coastal County Non-Surge N=16
Public Shelter	3	17	0
Church	0	0	6
Friend/Relative	73	70	81
Hotel/Motel	15	9	6
Workplace	2	0	6

Other	7	4	0

Evacuation Destinations and Transportation Issues

Most evacuees stayed in their own county (Table 13). The great majority of those who left their county went elsewhere in Florida (Table 14). Some evacuees went up the eastern seaboard or to the Midwest.

Table 13. Percent of evacuees by destination, by risk zone

	Cat 1 Surge Zone N=66	Other Surge Zones N=16	Coast Non-Surge N=16
Own Neighborhood	17	44	19
Own County	52	56	44
Out of County	32	0	38

Table 14. Percent of out-of-county evacuees, by state destination

Florida	88
Georgia	3
South Carolina	0
North Carolina	0
Virginia	0

Alabama	0
Tennessee	0
Other	9

Those who went out-of-county did so mainly because they had friends or relatives in those locations (Table 15). Information from government, friends, and the media all had some effect on where evacuees went (Table 16), but sample sizes were very small.

Table 15. Why Went Out of County

	Cat 1 Surge Zone N=26	Other Surge Zone N=7	Coastal County Non-surge N=6
Strength of Storm	19	29	17
Previous Hurri-cane Experience	14	0	0
Comparisons to Hugo/Andrew	5	0	0
Officials Said Leave County	0	0	0
Media Said Leave County	0	0	0
Friend Said Leave County	5	14	17
Friend Lives in Destination	67	71	50
No Public Shelter Closer	0	0	0
No Motels Closer	10	0	0
Other	0	29	17

Don't Know	5	0	0

Table 16. Greatest Influence for Going Out of County

	Cat 1 Surge Zone N=20	Other Surge Zones N=7	Coastal County Non-surge N=6
Media Info from Gov't Officials	30	43	17
Other Media Info	30	29	33
Info from Friends	30	29	50
Other	5	14	0
Don't Know	5	0	0

Ninety percent of the evacuees from most risk areas eventually reached their destinations (Table 17). Far too few in our sample changed destinations to draw conclusions about the nature of the new destinations (Table 18) or reasons for changing (Table 19).

Table 17. Whether Reached Original Destination

	Cat 1 Surge Zone N=66	Other Surge Zones N=22	Coastal County Non-surge N=16
Yes	96	77	94
No	5	14	6
Don't Know	0	9	0

Table 18. Proximity of New Destination, Compared to Original Destination

	Cat 1 Surge Zone N=3	Other Surge Zones N=2	Coastal County Non-surge N=1
Farther	33	50	100
Closer	67	0	0
Same	0	50	0
Don't Know	0	0	0

Table 19. Why Changed Destination

	Cat 1 Surge Zone N=3	Other Surge Zones N=2	Coastal County Non-surge N=1
Traffic			
Better Route			
Loc. of Refuge	33		
Out of Gas			
Tired			
Hungry			
Bathroom			
Storm Strengthened			
Storm Close	33		
Other	33	100	100

Don’t Know			

Most people said they did not hear about traffic problems on evacuation routes before leaving home (Table 20). Of those who heard about such problems before leaving home, no one said they changed their evacuation route plans (Table 21).

Table 20. Heard About Evacuation Route Problems Before Leaving Home

	Cat 1 Surge Zone N=67	Other Surge Zones N=22	Coastal County Non-surge N=16
Yes	31	18	25
No	67	82	75
Don’t Know	2	0	0

Table 21. Changed Routes Because of Information Heard Before Leaving Home

	Cat 1 Surge Zone N=21	Other Surge Zones N=4	Coastal County Non-surge N=4
Yes	0	0	0
No	100	100	100

Those who said they had heard about evacuation problems before leaving home were also asked whether they heard about such problems after leaving home. About half said they did (Table 22), but only one respondent changed route plans accordingly (Table 23). The sample is too small for meaningful conclusions.

Table 22. Heard About Evacuation Route Problems After Leaving Home

	Cat 1 Surge Zone N=21	Other Surge Zone N=4	Coastal County Non-surge N=4
Yes	48	50	100
No	52	50	0
Don't Know	0	0	0

Table 23. Changed Routes Because of Information Heard After Leaving Home

	Cat 1 Surge Zone N=10	Other Surge Zones N=2	Coastal County Non-surge N=4
Yes	10	0	0
No	90	100	100

About half of the evacuees used interstate highways for at least part of their evacuation (Table 24). Those who used interstates in Floyd were inclined to use them again (Table 25). (There were no questions specifically about Florida's Turnpike.) The great majority of the respondents said they were familiar with the roads in the area through which they evacuated (Table 26). More than two-thirds also said they would be willing to use a different route than they would normally use if government officials urged them to do so to avoid congestion, even if the route took them out of their way (Table 27).

Table 24. Used Interstate for at Least Part of Route

	Cat 1 Surge Zone N=67	Other Surge Zones N=22	Coastal County Non-surge N=16
Yes	46	50	38
No	51	46	63

Don’t Know	3	4	0

Table 25. Routes to be Used in the Future

	Cat 1 Surge Zone N=31	Other Surge Zones N=11	Coastal County Non-surge N=6
Interstate	58	46	83
Secondary Roads	7	27	0
Both	10	9	0
Depends on Traffic	16	9	0
Depends on Other	3	0	17
Other	0	0	0
Don’t Know	7	9	0

Table 26. Familiar with Roads in Area

	Cat 1 Surge Zone N=66	Other Surge Zones N=22	Coastal County Non-surge N=16
Yes	88	96	88
No	9	5	13
Don’t Know	3	0	0

Table 27. Would Use Routes Advised by Officials, Even if Longer

	Cat 1 Surge Zone N=66	Other Surge Zones N=22	Coastal County Non-surge N=16
Yes	77	68	75
No	6	5	19
Depends How Much Longer	3	9	6
Depends on Other	5	9	0
Other	2	0	0
Don't Know	8	9	0

More than three-fourth's of the respondents said it took them less than two hours to reach their destination (Table 28). Still, times were slightly longer than expected (Table 29). When asked how long it was reasonable for an evacuation like Floyd's to take, most respondents gave times shorter than the actual evacuation but slightly longer than their original expectation (Table 30).

Table 28. Hours Required to Reach Destination

	Cat 1 Surge Zone N=66	Other Surge Zones N=20	Coastal County Non-surge N=16
Less than 2	86	75	88
2 to 5	11	15	6
5 to 10	2	10	6
10 or more	2	0	0
Mean No. Hrs	1.3	1.6	1.0
Median No. Hrs	.5	.5	.5

Table 29. Hours Expected to Reach Destination

	Cat 1 Surge Zone N=64	Other Surge Zones N=19	Coastal County Non-surge N=16
Less than 2	89	84	94
2 to 5	9	11	6
5 to 10	0	5	0
10 or more	2	0	0
Mean No. Hrs	1.2	1.4	.9
Median No. Hrs	.5	.5	.5

Table 30. Hours Reasonable to Reach Destination

	Cat 1 Surge Zone N=61	Other Surge Zones N=81	Coastal County Non-surge N=16
Less than 2	87	81	94
2 to 5	10	13	0
5 to 10	2	6	6
10 or more	2	0	0
Mean No. Hrs	1.4	1.3	.5
Median No. Hrs	.5	.5	.5

Of those who ventured an opinion, most people thought traffic delays were caused mainly by the sheer volume of traffic and the fact that too many people left at once (Table 31). No one cited poor

traffic management or advocated reversing lane directions. More than 80% of the respondents said they would be willing to cooperate in a phased evacuation in which they would delay their departure for a few hours until people in a more dangerous location had begun their evacuation (Table 32).

Table 31. Why Traffic Was Slow

	Cat 1 Surge Zone N=66	Other Surge Zones N=21	Coastal County Non-surge N=16
Number of Cars	15	33	25
All Left at Once	24	24	25
Waited too Long	8	0	19
Construction	2	5	6
Accidents	3	5	0
Poor Traffic Management	0	0	0
Need Reverse Lanes	0	0	0
Bad Weather	3	10	0
Other	18	33	13
Don't Know	46	24	31

Table 32. Would Delay Departure if Urged by Officials

	Cat 1 Surge Zone N=201	Other Surge Zones N=204	Coastal County Non-surge N=205

Yes	79	84	86
Depends on Storm's Proximity	5	3	3
Depends on Storm's Strength	2	1	2
Other	1	1	0
Don't Know	5	3	5
No	10	8	4

Very few evacuees not cited specific difficulties experienced during the evacuation (Table 33). Fewer than half of the evacuees said they heard about places where they could find shelter if they weren't able to reach their destinations (Table 34), and few of those who did hear such announcements changed their plans about seeking shelter as a result (Table 35). A small number of interviewees reported roads being blocked by water or having other difficulties when returning from the evacuation (Table 36).

Table 33. Difficulties Experienced in Evacuation

	Cat 1 Surge Zone N=67	Other Surge Zones N=22	Coastal County Non-surge N=16
Ran Out of Gas		4	
Car Broke Down	2		
Needed Water			
Needed Food			
Needed Restroom	2		
Other Difficulties	2		
No Difficulties	96	96	100

Table 34. Heard About Refuge Options After Leaving Home

	Cat 1 Surge Zone N=66	Other Surge Zones N=22	Coastal County Non-surge N=16
Yes	36	50	38
No	58	50	63
Don't Know	6	0	0

Table 35. Changed Plans Because of Refuge Information Heard After Leaving Home

	Cat 1 Surge Zone N=23	Other Surge Zones N=10	Coastal County Non-surge N=6
Yes	4	10	0
No	96	90	100

Table 36. Difficulties Experienced Returning from Evacuation

	Cat 1 Surge Zone N=67	Other Surge Zones N=21	Coastal County Non-surge N=16
Lack of Information	0	0	0
Roads Blocked by Water/Debris	8	5	0
Traffic Congested	2	0	6
Re-entry Not Permitted	2	0	0

Other Difficulties	3	0	0
No Difficulties	88	95	100

Vehicle use was similar to that in most evacuations, in which 65% to 75% of the available vehicles are used (Table 37). Few households required assistance in evacuating, and in most instances outside agencies were not required (Table 38).

Table 37. Vehicle Use by Evacuating Households

	Cat 1 Surge Zone N=66	Other Surge Zones N=21	Coastal County Non-surge N=16
Percent of Available	66	58	70
Avg. Number Per Household	1.08	1.0	1.0
Pulled Trailer, Took Motorhome	1.7	0	0

Table 38. Required Assistance in Evacuating (As a Percent of All Households)

	Cat 1 Surge Zone N=67	Other Surge Zones N=22	Coastal County Non-surge N=16
Yes, Within Household	5	0	0
Yes, Friend/ Relative	5	0	0
Yes, Agency	0	4	0

No	90	96	100

Local television was relied upon most heavily by the respondents for information about Floyd, followed by The Weather Channel (Table 39). Local radio was the third most relied-upon source of information. Less than 10% relied a great deal on the internet or on-line services.

Table 39. Sources Relied On a Great Deal for Information about Floyd

	Cat 1 Surge Zone N=200	Other Surge Zones N=201	Coastal County Non-surge N=202
Local Radio	31	30	34
Local Television	85	88	84
CNN	23	21	25
Weather Channel	55	38	37
Other Cable	3	9	5
Internet	6	4	4
AOL	4	1	3
Word of Mouth	15	10	6

Most respondents in the sample said they wouldn't do anything differently if faced with the same

circumstances again as in Floyd (Table 40). Some who left wouldn't, but some who didn't leave would. Some would plan to leave earlier, and others said they would prepare better by taking provisions such as food and water.

Table 40. Would Do Differently Next Time

	Cat 1 Surge Zone N=201	Other Surge Zones N=203	Coastal County Non-surge N=204
Would Leave	7	6	4
Wouldn't Leave	8	3	6
Leave Earlier	5	3	1
Leave Later	0	1	1
Go Farther	1	1	0
Go Closer	1	3	0
Use Public Shelter	2	3	1
Not Use Pub Shltr	0	2	0
Different Route	1	0	0
Buy Gasoline	2	1	1
Take Provisions	4	3	3
Other	6	7	7
Don't Know	6	5	4
Nothing Different	73	76	78

Cover

Chapter 2

Public Response to Hurricane Floyd

In the Treasure Coast Florida Region

Prepared by

Earl J. Baker

Hazards Management Group, Inc.

Survey Method

Approximately 600 telephone interviews were conducted in the Treasure Coast region of Florida, including the coastal counties of Palm Beach, Martin, St. Lucie, and Indian River. The sample was stratified as follows:

1. 200 interviews in areas at risk to storm surge in category 1 hurricanes
2. 200 interviews in areas at risk to storm surge in stronger hurricanes
3. 100 interviews in areas of coastal counties not subject to inundation by storm surge
4. 100 interviews in non-coastal counties adjacent to the coastal counties.

Evacuation zones defined in the most recent hurricane evacuation study for the region were used to identify the sampling areas. A copy of the generic questionnaire used in post-Floyd surveys is included as Appendix I.

Statistical Reliability

Figures reported from surveys cited in this report are based upon samples taken from larger populations. The sample values provide estimates of the values of the larger populations from which the samples were selected, but usually are not precisely the same as the true population values. In general, the larger the number of people in the sample, the closer the sample value will be to the true population value. A sample of 200 will provide estimates which one can be 90% “confident” are within 4 to 6 percentage points of the true populations values, whereas a sample of 100 will provide the same degree of confidence of being within 5 to 8 percentage points of the true population values. With a sample of 50, one can be 90% "confident" of being within 7 to 11 percentage points of the actual population value, and a sample of 25 is 90% "accurate" only within 10 to 17 percentage points. With a sample of 50, one can be 90% "confident" of being within 7 to 12

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In nearly all tables data refer to percentages of respondents. In response to some questions respondents could give more than one answer, resulting in totals exceeding 100%.

Evacuation Participation Rates

Evacuation, as used in the survey, refers to leaving one's home to go someplace safer. In the category 1 risk zone, just under 40% evacuated, as did 25% in other surge zones (Table 1). Slightly less than 25% left from non-surge areas and adjacent non-coastal counties. Evacuation orders applied only to the category 1 surge zone, plus mobile homes, meaning that evacuees from other areas were considered "shadow evacuees."

Table 1. Percent who left their homes in Floyd, by risk zone

	Cat 1 Surge Zone N=199	Other Surge Zones N=204	Coastal Non-surge N=99	Non-coastal Counties N=111

Evacuated	39	25	23	22

Most of the residents who did not evacuate gave the same reason: they felt their home would be safe enough, given their beliefs about the likely track and strength of the storm (Table 2). No other single reason was prominent in the responses.

Table 2. Why Stayed (Percent of Respondents)

	Cat 1 Surge Zone N=156	Other Surge Zones N=152	Coastal County Non-Surge N=76	Non-coastal Counties N=84
House OK for Storm	68	72	75	71
Officials Said Stay	2	5	4	5
Media Said Stay	3	4	4	7
Friends Said Stay	1	1	3	2
Officials Didn't Say Leave	5	9	3	5
Probabilities Low	15	11	15	12
Other Info. Would Miss	5	3	4	0
No Transport	1	0	3	0
No Place to Go	2	5	12	1
Protect from Looters	0	1	0	0

Protect from Storm	3	3	9	2

Table 2. Why Stayed (Percent of Respondents) continued

Left in Past Miss	6	3	1	4
Job	7	1	3	1
Waited Too Long	1	1	1	0
Traffic	3	2	4	1
Tried, Gave Up	1	1	0	0
Dangerous on Road	1	1	1	0
Pets	2	3	3	0
Required Medical Care	0	0	0	2
Other	9	7	8	4
Don't Know	2	7	1	1

Jobs were mentioned by some, and respondents were asked specifically whether anyone in their household had to work during Floyd and how that affected their evacuation (Tables 3, 4). At least a fourth said someone in the household had to work, and some (but not most) said it either prevented part of the household from evacuating or delayed their departure.

Table 3. Someone in Household Had to Work in Floyd

	Cat 1 Surge Zone N=200	Other Surge Zones N=205	Coastal County Non-surge N=100	Non-coastal Counties N=36

Yes	28	29	29	36
No	72	71	71	64

Table 4. How Work Affected Evacuation in Floyd

	Cat 1 Surge Zone N=55	Other Surge Zones N=60	Coastal County Non-surge N=29	Non-coastal Counties N=39

None	84	77	86	87
Kept All from Leaving	4	3	10	5
Kept Part from Leaving	4	2	0	0
Delayed All in Leaving	7	8	0	5
Delayed Part in Leaving	2	5	0	3
Other	0	5	3	0

Those who didn't evacuate were asked whether they would have left had they been convinced the storm was going to strike, and at least half in most risk zones said they would have (Table 5). Most in surge zones also said they had made the necessary preparations to leave in case conditions worsened (Table 6).

Table 5. Stayers Who Say They Would Have Left If Convinced Storm Was Going to Hit

	Cat 1 Surge Zone N=121	Other Surge Zones N=154	Coastal County Non-surge N=76	Non-coastal Counties N=87
Would Have Left	52	54	38	54
Wouldn't Have Left	38	36	43	28
Don't Know	10	10	18	18

Table 6. Stayers Who Say They Had Made Necessary Preparations to Leave

	Cat 1 Surge Zone N=121	Other Surge Zones N=154	Coastal County Non-surge N=76	Non-coastal Counties N=87
Had Prepared	60	60	45	60
Hadn't Prepared	41	38	53	38
Don't Know	0	0	3	2

Evacuees were asked what convinced them to leave, and most indicated some combination of response to actions by public officials, media messages, and concern about storm conditions (Table 7.)

Table 7. Why Left (Percent of Respondents)

	Cat 1 Surge Zone N=123	Other Surge Zones N=49	Coastal County Non-surge N=20	Non-coastal Counties N=24
Officials Said Leave	26	12	15	4
NWS Said Leave	11	22	0	0
Police/Fire Said Leave	16	0	5	0
Media Said Leave	15	27	10	13
Friend Said Leave	12	18	20	13
Storm Severe	26	35	30	42

Heard “Bad as Hugo/ Andrew”	9	0	15	13
Increased in Strength	1	2	0	4
Concerned about Flooding	12	6	5	8
Concerned about Winds	17	8	15	25
Concerned re. Road Flooding	4	0	0	0
Probability of Hit	7	14	20	21
Post-Storm Concerns	7	14	20	21
Other	0	2	5	4
Don’t Know	0	0	0	0

In an attempt to separate the effect of messages disseminated by government officials via the media from the effect of other information heard via the media, respondents were asked which had the greater impact on their decision to evacuate. Information from officials had the greater impact in the category 1 surge zone, but not in other areas, according to respondents (Table 8).

Table 8. Greatest Influence to Leave (Percent of Respondents)

	Cat 1 Surge Zone N=76	Other Surge Zones N=48	Coastal County Non-surge N=20	Non-coastal Counties N=24
Media Info from Gov't Officials	51	42	35	21
Other Media Info	36	38	40	46
Info from Friends	21	17	25	32
Other	11	6	10	0
Don't Know	0	2	0	0

Interviewees were also asked whether they heard from officials – either directly or indirectly – that they should evacuate. Even in the category 1 risk area only 35% said they did (Table 9). Those who did hear evacuation notices were more likely than others to evacuate, particularly if they believed the notice to be mandatory (Table 10).

Table 9. Heard Evacuation Notices from Officials

	Cat 1 Surge Zone N=199	Other Surge Zones N=204	Coastal County Non-Surge N=100	Non-coastal Counties N=111
Heard Notice	35	17	11	10
Didn't Hear	62	80	85	89
Don't Know	3	3	4	1

Table 10. Evacuation Participation Rates, by Hearing Evacuation Notices from Officials

(Sample sizes vary by cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Heard Must	66	46	75	78
Heard Should	32	37	30	46
Didn't Hear	26	20	18	17

In none of the four risk areas did a majority of respondents believe they would be unsafe in a 125 MPH hurricane in their own homes (Table 11a). In all four risk zones people who perceived their homes to be vulnerable were more likely than others to evacuate in Floyd (Table 11b).

Table 11a. Perceived Safety of Home from Wind and Water in 125 MPH Hurricane

	Cat 1 Surge Zone N=199	Other Surge Zones N=204	Coastal County Non-Surge N=100	Non-coastal Counties N=111
Safe	45	49	59	42
Unsafe	42	39	28	48
Don't Know	13	12	13	10

Table 11b. Evacuation Participation Rates, by Perceived Safety in 125 MHP Storm (See previous table for sample sizes for each cell)

	Cat 1 Surge Zone	Other Surge Zones	Coastal County Non-Surge	Non-coastal Counties
Safe	23	14	17	11
Unsafe	50	40	36	34
Don't Know	54	20	23	9

Evacuation Timing

Evacuation departures were fairly gradual, primarily during September 13th and 14th with the most of the

evacuation occurring on the 13th. By the end of the 13th more than 60% of the evacuees had left. A hurricane watch was issued for the area at 5 AM on the 13th, followed by a warning at 5 PM later that same day.

Use of Public Shelters and Other Refuges

The majority of evacuees went to the homes of friends and relatives or to hotels and motels (Table 12). Only in “other surge” areas did more than five percent of those interviewed say they went to public shelters.

Table 12. Refuges Uses by Evacuees

	Cat 1 Surge Zone N=76	Other Surge Zones N=48	Coastal County Non-Surge N=20	Non-coastal Counties N=24
Public Shelter	1	8	0	4
Church	0	2	0	0
Friend/Relative	59	56	80	63
Hotel/Motel	34	25	20	21

Workplace	3	6	0	0
Other	3	2	0	12

Evacuation Destinations and Transportation Issues

Approximately half of the evacuees left their own county, most going elsewhere in Florida (Tables 13, 14). Five percent went into Georgia.

Table 13. Percent of evacuees by destination, by risk zone

	Cat 1 Surge Zone N=79	Other Surge Zones N=49	Coast Non-Surge N=20	Non-Coastal Counties N=24
Own Neighborhood	23	18	25	19
Own County	25	31	25	13
Out of County	52	51	50	46

Table 14. Percent of out-of-county evacuees, by state destination

Florida	93
Georgia	5
South Carolina	0
North Carolina	1
Virginia	0
Alabama	0
Tennessee	0
Other	1

Going out of county was motivated by three main factors: the strength of the storm, the location of friends and family, and the lack of closer motels (Table 15). The relative influence of public officials and media varied by risk zone (Table 16), although the patterns in the non-surge areas are not significant due to the small number of respondents in those areas answering the question.

Table 15. Why Went Out of County

	Cat 1 Surge Zone N=40	Other Surge Zone N=25	Coastal County Non-surge N=10	Non-coastal Counties N=10
Strength of Storm	33	32	30	40
Previous Hurri-cane Experience	8	0	10	10
Comparisons to Hugo/Andrew	8	0	0	0
Officials Said Leave County	0	4	0	0
Media Said Leave County	5	4	0	10
Friend Said Leave County	13	8	10	0
Friend Lives in Destination	35	52	50	60
No Public Shelter Closer	3	0	0	10
No Motels Closer	20	8	0	20
Other	18	8	10	0
Don’t Know	0	0	0	0

Table 16. Greatest Influence for Going Out of County

	Cat 1 Surge Zone N=41	Other Surge Zones N=25	Coastal County Non-surge N=10	Non-coastal Counties N=10
Media Info from Gov't Officials	29	40	10	20
Other Media Info	39	28	60	50
Info from Friends	24	32	40	20
Other	12	4	20	10
Don't Know	10	8	0	0

Over 90% of the evacuees from most risk areas eventually reached their destinations (Table 17). Descriptions of the new destinations and reasons for changing are not meaningful due to the very small samples (Tables 18, 19).

Table 17. Whether Reached Original Destination

	Cat 1 Surge Zone N=81	Other Surge Zones N=49	Coastal County Non-surge N=20	Non-coastal Counties N=24

Yes	95	98	95	92
No	5	2	5	8
Don't Know	0	0	0	0

Table 18. Proximity of New Destination, Compared to Original Destination

	Cat 1 Surge Zone N=4	Other Surge Zones N=1	Coastal County Non-surge N=1	Non-coastal Counties N=2
Farther	75	100	100	
Closer	25	0	0	100
Same	0	0	0	0
Don't Know	0	0	0	0

Table 19. Why Changed Destination

	Cat 1 Surge Zone N=3	Other Surge Zones N=1	Coastal County Non-surge N=1	Non-coastal Counties N=2
Traffic	33			
Better Route				
Loc. of Refuge	33			

Out of Gas				
Tired				
Hungry				
Bathroom				
Storm Strengthened				
Storm Close				
Other	33	100	100	100
Don't Know				

Most people said they did not hear about traffic problems on evacuation routes before leaving home (Table 20). Of those who heard about such problems before leaving home, most did not change their evacuation route plans (Table 21), but there were few respondents who were asked the question.

Table 20. Heard About Evacuation Route Problems Before Leaving Home

	Cat 1 Surge Zone N=79	Other Surge Zones N=50	Coastal County Non-surge N=20	Non-coastal Counties N=24
Yes	15	24	20	29

No	81	74	80	71
Don't Know	4	2	0	0

Table 21. Changed Routes Because of Information Heard Before Leaving Home

	Cat 1 Surge Zone N=12	Other Surge Zones N=11	Coastal County Non-surge N=4	Non-coastal Counties N=7
Yes	25	9	50	14
No	75	91	50	86

Those who said they had heard about evacuation problems before leaving home were also asked whether they heard about such problems after leaving home, and if so, whether they changed their route (Tables 22, 23). When disaggregated by risk area, there were too few observations to be useful.

Table 22. Heard About Evacuation Route Problems After Leaving Home

	Cat 1 Surge Zone N=12	Other Surge Zone N=12	Coastal County Non-surge N=4	Non-coastal Counties N=7
Yes	0	58	50	29
No	92	42	50	57
Don't Know	8	0	0	14

Table 23. Changed Routes Because of Information Heard After Leaving Home

	Cat 1 Surge Zone N=0	Other Surge Zones N=7	Coastal County Non-surge N=2	Non-coastal Counties N=2
Yes		14	100	0
No		86	0	100

Most evacuees did not use interstate highways for even part of their evacuation (Table 24). Those who used interstates in Floyd were inclined to use them again (Table 25). (Interviewees were not asked specifically about Florida's Turnpike.) The great majority of the respondents said they were familiar with the roads in the area through which they evacuated (Table 26). More than three-fourths also said they would be willing to use a different route than they would normally use if government officials urged them to do so to avoid congestion, even if the route took them out of their way (Table 27).

Table 24. Used Interstate for at Least Part of Route

	Cat 1 Surge Zone N=79	Other Surge Zones N=50	Coastal County Non-surge N=20	Non-coastal Counties N=24
Yes	37	32	45	25
No	62	66	55	71
Don't Know	1	2	0	4

Table 25. Routes to be Used in the Future

	Cat 1 Surge Zone N=29	Other Surge Zones N=16	Coastal County Non-surge N=9	Non-coastal Counties N=6
Interstate	69	88	67	83
Secondary Roads	10	6	0	17
Both	10	6	11	0
Depends on Traffic	10	0	0	0
Depends on Other	0	0	11	0
Other	0	0	11	0
Don't Know	0	0	0	0

Table 26. Familiar with Roads in Area

	Cat 1 Surge Zone N=79	Other Surge Zones N=50	Coastal County Non-surge N=20	Non-coastal Counties N=24
Yes	91	92	90	92
No	8	4	10	4
Don't Know	1	4	0	4

Table 27. Would Use Routes Advised by Officials, Even if Longer

	Cat 1 Surge Zone N=79	Other Surge Zones N=50	Coastal County Non-surge N=20	Non-coastal Counties N=24
Yes	80	84	65	75
No	4	4	15	21
Depends How Much Longer	3	0	0	0
Depends on Other	13	10	15	0
Other	0	2	0	0
Don't Know	1	0	5	4

More than half the respondents said it took them less than two hours to reach their destination (Table 28). Still, times were slightly longer than expected (Table 29). When asked how long it was reasonable for an evacuation like Floyd's to take, most respondents gave times shorter than the actual evacuation but slightly longer than their original expectation (Table 30).

Table 28. Hours Required to Reach Destination

	Cat 1 Surge Zone N=77	Other Surge Zones N=48	Coastal County Non-surge N=20	Non-coastal Counties N=23
Less than 2	64	71	70	83
2 to 5	29	23	15	13
5 to 10	7	4	15	0
10 or more	1	2	0	4

Mean No. Hrs	2.5	1.9	2.0	1.8
Median No. Hrs	1.0	.5	.5	.5

Table 29. Hours Expected to Reach Destination

	Cat 1 Surge Zone N=77	Other Surge Zones N=48	Coastal County Non-surge N=20	Non-coastal Counties N=24
Less than 2	69	71	70	83
2 to 5	27	25	20	13
5 to 10	3	2	10	4
10 or more	1	2	0	0
Mean No. Hrs	2.2	.5	1.8	1.6
Median No. Hrs	1.0	.5	.5	.5

Table 30. Hours Reasonable to Reach Destination

	Cat 1 Surge Zone N=74	Other Surge Zones N=48	Coastal County Non-surge N=20	Non-coastal Counties N=23
Less than 2	66	69	65	83
2 to 5	28	25	15	13

5 to 10	4	6	20	0
10 or more	1	0	0	4
Mean No. Hrs	2.4	.5	2.3	1.8
Median No. Hrs	1.0	.5	.5	.5

Of those who offered an opinion, most people thought the traffic delays were caused mainly by the sheer volume of traffic and the fact that too many people left at once (Table 31). Some also cited poor traffic management. More than 80% of the respondents said they would be willing to cooperate in a phased evacuation in which they would delay their departure for a few hours until people in a more dangerous location had begun their evacuation (Table 32).

Table 31. Why Traffic Was Slow

	Cat 1 Surge Zone N=78	Other Surge Zones N=49	Coastal County Non-surge N=20	Non-coastal Counties N=24
Number of Cars	35	16	45	17
All Left at Once	32	25	20	17
Waited too Long	13	10	10	4
Construction	0	2	0	0
Accidents	1	8	0	0
Poor Traffic Management	4	10	0	13
Need Reverse Lanes	1	0	0	0
Bad Weather	1	6	0	0
Other	5	12	25	13

Don’t Know	41	39	30	54

Table 32. Would Delay Departure if Urged by Officials

	Cat 1 Surge Zone N=200	Other Surge Zones N=204	Coastal County Non-surge N=100	Non-coastal Counties N=110
Yes	89	88	86	86
Depends on Storm’s Proximity	2	2	4	1
Depends on Storm’s Strength	2	2	3	4
Other	0	1	0	0
Don’t Know	4	3	3	4
No	4	4	4	6

Few evacuees cited specific difficulties experienced during the evacuation. Needing restroom facilities was most common (Table 33). Most evacuees said they didn’t hear announcements about places where they could find shelter if they weren’t able to reach their destinations (Table 34). No one who did hear announcements said they changed plans about seeking shelter as a result (Table 35). Most evacuees reported no problems returning home after the evacuation (Table 36).

Table 33. Difficulties Experienced in Evacuation

	Cat 1 Surge Zone N=79	Other Surge Zones N=50	Coastal County Non-surge N=20	Non-coastal Counties N=24
Ran Out of Gas				
Car Broke Down	1			
Needed Water				
Needed Food		2		
Needed Restroom	3	2		
Other Difficulties				
No Difficulties	96	98	100	100

Table 34. Heard About Refuge Options After Leaving Home

	Cat 1 Surge Zone N=79	Other Surge Zones N=50	Coastal County Non-surge N=19	Non-coastal Counties N=24
Yes	33	32	16	33
No	60	68	84	67
Don’t Know	6	0	0	0

Table 35. Changed Plans Because of Refuge Information Heard After Leaving Home

	Cat 1 Surge Zone N=25	Other Surge Zones N=16	Coastal County Non-surge N=3	Non-coastal Counties N=8
Yes	0	0	0	0
No	100	100	100	100

Table 36. Difficulties Experienced Returning from Evacuation

	Cat 1 Surge Zone N=79	Other Surge Zones N=50	Coastal County Non-surge N=20	Non-coastal Counties N=24
Lack of Information	0	0	0	0
Roads Blocked by Water/Debris	1	0	5	0
Traffic Congested	15	8	10	0
Re-entry Not Permitted	1	0	0	0
Other Difficulties	0	2	0	0
No Difficulties	82	90	85	100

Vehicle use was typical of most evacuations, in which 65% to 75% of the available vehicles are used (Table 37). Few households required assistance in evacuating, and in most instances outside agencies were not required (Table 38).

Table 37. Vehicle Use by Evacuating Households

	Cat 1 Surge Zone N=78	Other Surge Zones N=50	Coastal County Non-surge N=20	Non-coastal Counties N=24
Percent of Available	63	64	66	57
Avg. Number Per Household	1.15	1.14	1.05	1.17
Pulled Trailer, Took Motorhome	3.9	2.0	0	4.2

Table 38. Required Assistance in Evacuating (As a Percent of All Households)

	Cat 1 Surge Zone N=79	Other Surge Zones N=50	Coastal County Non-surge N=20	Non-coastal Counties N=24
Yes, Within Household	3	6	0	0
Yes, Friend/ Relative	3	0	0	0
Yes, Agency	3	0	0	4
No	91	94	100	96

Local television was relied upon most heavily by the respondents for information about Floyd, followed by The Weather Channel (Table 39). Local radio and CNN were the next most relied-upon sources of information.

Table 39. Sources Relied On a Great Deal for Information about Floyd

	Cat 1 Surge Zone N=197	Other Surge Zones N=203	Coastal County Non-surge N=99	Non-coastal Counties N=109
Local Radio	21	24	19	19
Local Television	73	73	69	86
CNN	24	18	21	27
Weather Channel	55	46	54	54
Other Cable	10	4	7	9
Internet	7	4	2	6
AOL	5	1	1	1
Word of Mouth	8	6	3	10

Most respondents in the sample said they wouldn't do anything differently if faced with the same circumstances again as in Floyd (Table 40). Some who left wouldn't, but some who didn't leave would. Some would plan to leave earlier.

Table 40. Would Do Differently Next Time

	Cat 1 Surge Zone N=199	Other Surge Zones N=205	Coastal County Non-surge N=100	Non-coastal Counties N=110
Would Leave	3	6	3	6
Wouldn't Leave	8	2	1	8
Leave Earlier	7	5	4	9

Leave Later	1	1	0	2
Go Farther	1	1	1	2
Go Closer	2	1	0	0
Use Public Shelter	1	1	0	0
Not Use Pub Shltr	1	0	0	1
Different Route	1	0	0	0
Buy Gasoline	0	2	0	0
Take Provisions	2	2	0	3
Other	4	6	5	0
Don’t Know	6	2	2	2
Nothing Different	70	76	87	72